

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2530.—VOL. LIV.

LONDON, SATURDAY, FEBRUARY 16, 1884.

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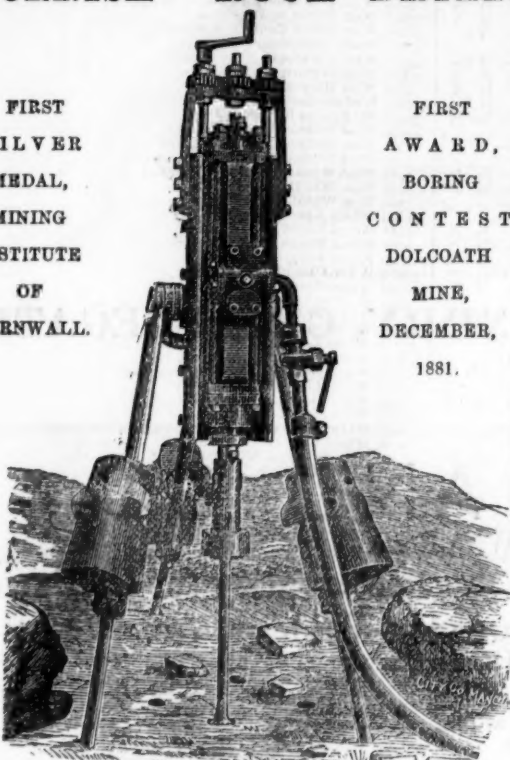
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—Highest Award for Effectiveness in Boring, and Economy in
the Consumption of Air

JUBILEE EXHIBITION, 1882.

THE PATENT

"CORNISH" ROCK DRILL.

FIRST
SILVER
MEDAL,
MINING
INSTITUTE
OF
CORNWALL.



FIRST
AWARD,
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CONTEST
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DECEMBER,
1881.

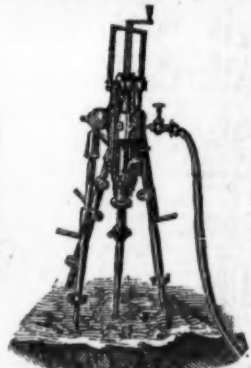
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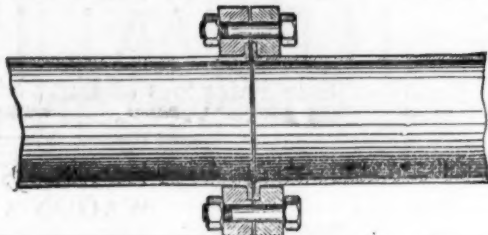
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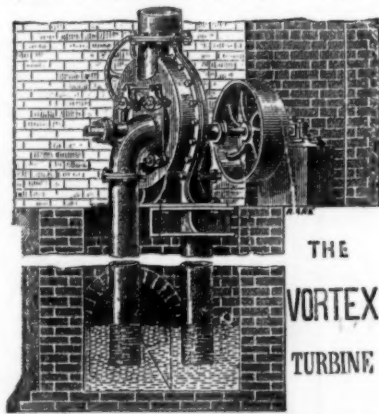
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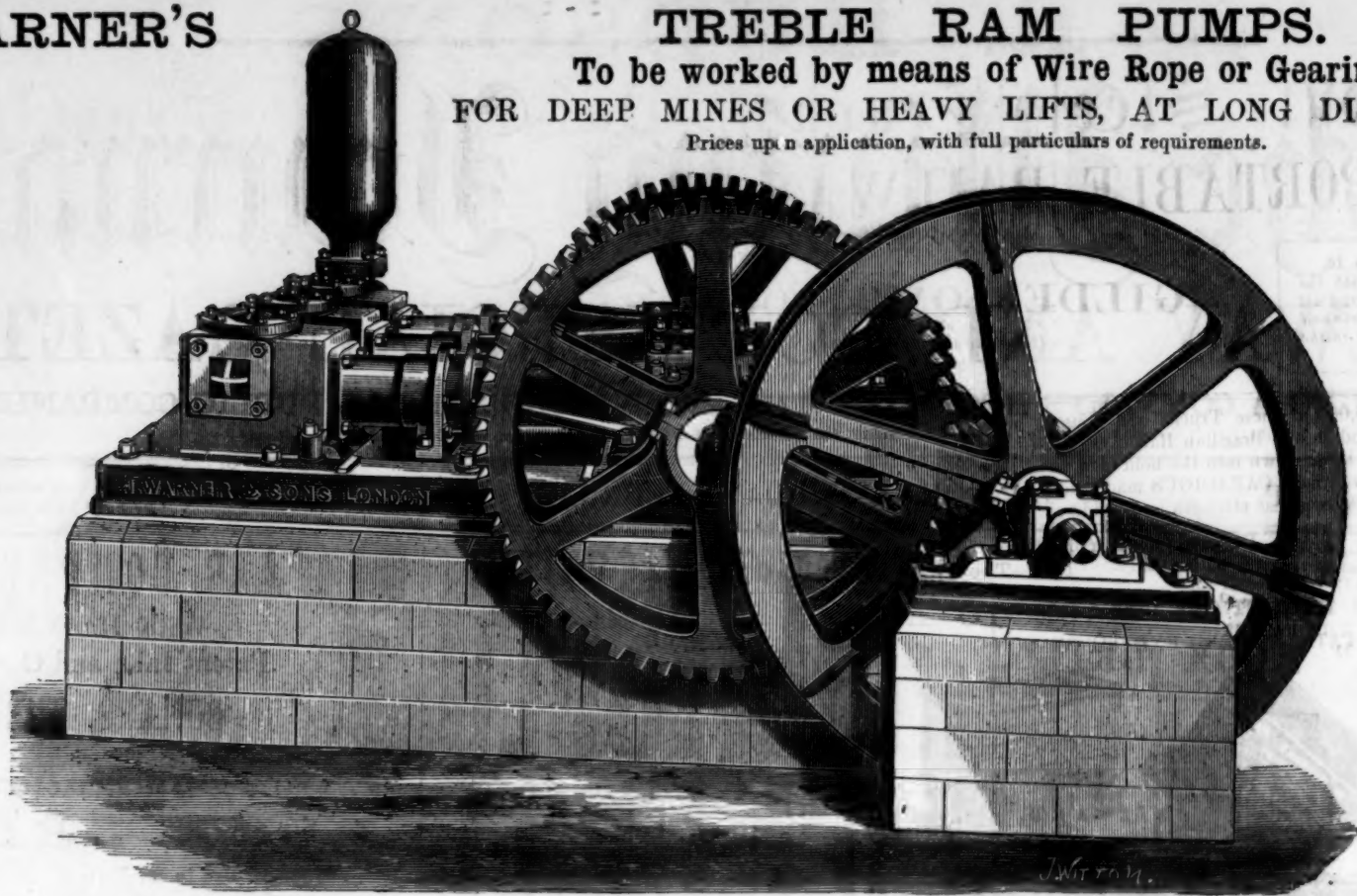
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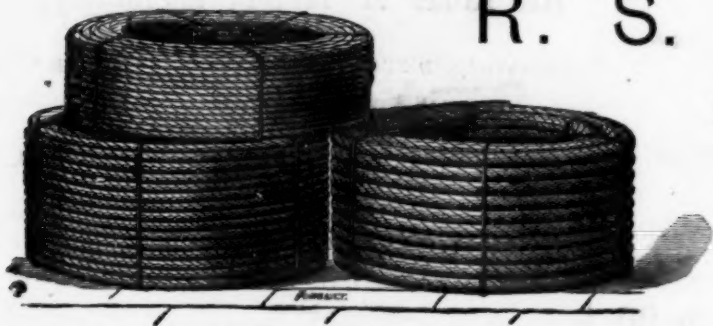
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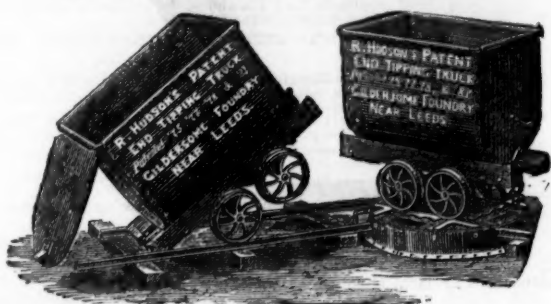
UPWARDS of 25,000 of these Trucks and Wagons have been supplied to the South African Diamond Mines; American, Spanish, Indian, and Welsh Gold, Silver, Copper, and Lead Mines; Indian and Brazilian Railways, and to Railway Contractors, Chemical Works, Brick Works, and Coal and Mineral Shippers, &c., &c., and can be made to lift off the underwork, to let down into the hold of a vessel, and easily replaced. They are also largely used in the Coal and other Mines in this country, and are the **LIGHTEST, STRONGEST**, and most **CAPACIOUS** made, infinitely stronger and lighter than wooden ones, and are all fitted with R. H.'s Patent "Rim" round top of wagons, requiring no rivets, and giving immense strength and rigidity. End and body plates are also joined on R. H.'s patent method, dispensing with angle-irons or corner plates.

Patented in Europe, America, Australia, India, and British South Africa, 1875, 1877, 1878, 1881, and 1883.

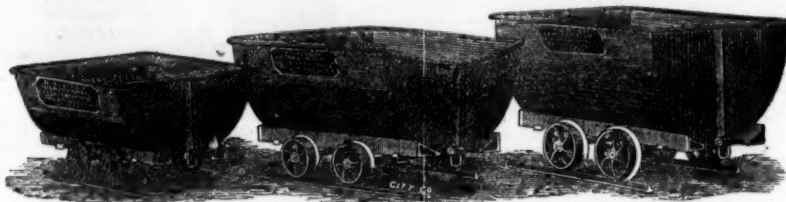
N.B.—The American, Australian, Indian, and Spanish Patents on Sale.

CAN BE MADE TO ANY SIZE, AND TO ANY GAUGE OF RAILS.

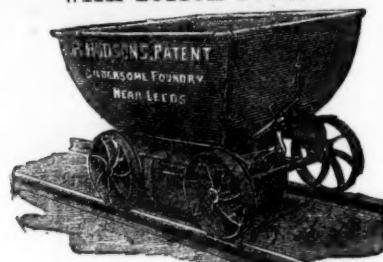
1.—PATENT STEEL END TIP WAGONS.



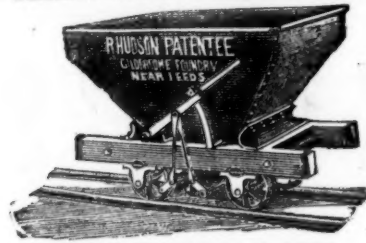
7.—PATENT STEEL MINING WAGONS.



12.—PATENT STEEL HOPPER WAGON,
WITH BOTTOM DOORS.



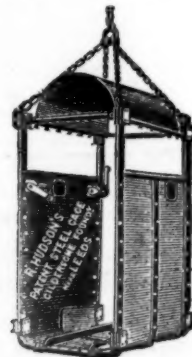
13.—PATENT STEEL HOPPER WAGON.



14.—SELF-RIGHTING STEEL
TIP BUCKET.
(The "CATCH" can also be made SELF-
ACTING if desired.)



15.—STEEL CAGE.



17.—STEEL SELF-CONTAINED
TURNTABLE.



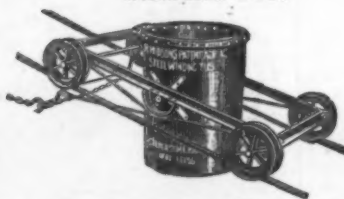
(Also made in Cast Iron for use where
weight is not a consideration.)

16.—PATENT STEEL WHEELBARROWS.
Made to any Size.
Lightest and Strongest in the Market.



A great success.

18.—"AERIAL" STEEL
WINDING TUB.

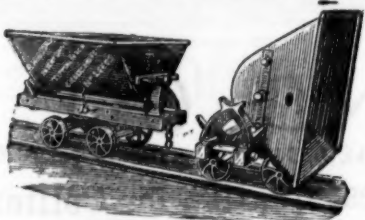


Largely employed in the South African
Diamond Fields.

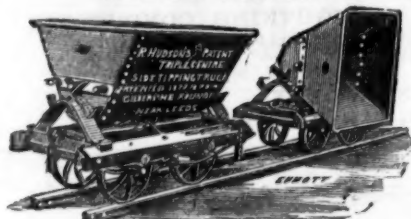


No. 19.—PATENT STEEL CHARGING BARROW,
DOUBLE the STRENGTH & much LIGHTER than ordinary Barrows.

2.—PATENT UNIVERSAL TRIPLE-CENTRE
STEEL TIPPING TRUCK,
Will tip either SIDE or either END of rails.



3.—PATENT TRIPLE-CENTRE STEEL
SIDE TIP WAGONS.



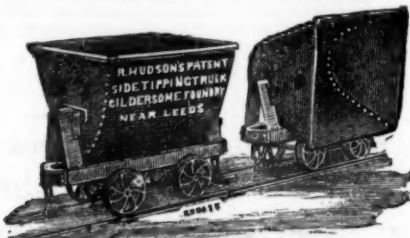
4.—PATENT STEEL PLATFORM OR
SUGAR CANE WAGON.



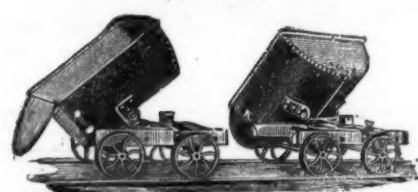
5.—PATENT STEEL CASK.
As supplied to H.M. War Office for the late war in Egypt.
DOUBLE the STRENGTH of ordinary Casks without any
INCREASE in weight.
(Made from 10 gals. capacity UPWARDS to any desired size.)



8.—PATENT DOUBLE-CENTRE STEEL
SIDE TIP WAGONS,
Will tip either side of Wagons.



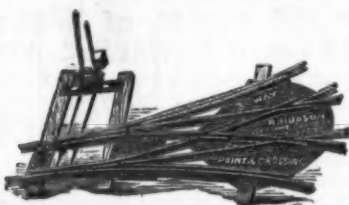
9.—PATENT STEEL ALL-ROUND TIP
WAGON.



10.—LEFT-HAND STEEL POINT AND
CROSSING.

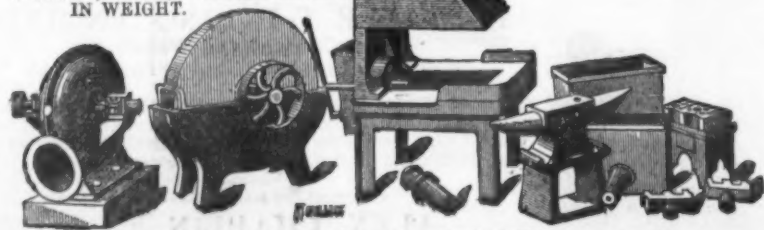


11.—RIGHT AND LEFT-HAND STEEL
POINT AND CROSSING.



6.—ROBERT HUDSON'S
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A Special quality made almost entirely
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BELL'S PATENT ASBESTOS BLOCK PACKING, for High Pressure Engines. This Packing has been specially designed to overcome the difficulties experienced by engineers and others in the practical working of engines of the most modern type of construction. The greatly increased skill and workmanship now obtained in the construction of engines and boilers have led to a rapid increase in the working pressure, the object being the attainment of a high rate of speed combined with economical working, the practical advantage of which, however, cannot be realised unless the Packings are so constructed as to avoid stoppages for the purpose of re-packing the stuffing boxes. It is now a recognised fact that the most perfect heat-resisting material suitable for the purpose of a Packing is Asbestos, but to ensure a successful application of this fibre, great skill is required in manufacture. In this Packing the Asbestos is woven into a stout cloth, and owing to the peculiar way in which it is manipulated, great elasticity is imparted to the Packing. This Packing has met with the most unqualified approval wherever it has been used, and on being taken out after about twelve months, working at 70 lb. pressure, it has been found to be in a perfect state of preservation, and was therefore replaced. The Patent Block Packing is square, as Fig. 1, and Figs. 2 and 3 represent the Round Block Packing with solid and hollow rubber core, and Fig. 4 without core, but with rubber inlay. An Engineer writes as follows:—"The Asbestos Block Packing works splendidly. I have never seen its equal. We keep our gland nuts so that you can move them with finger and thumb, and can maintain a constant vacuum of 25½ in." As these packings are extensively imitated, and as it is a common practice among dealers and agents to supply the cheaper manufactures at very low prices, users are requested to see that the packing supplied to them bears my trade mark.

BELL'S ASBESTOS BOILER PRESERVATIVE. This useful mixture by absorbing the free oxygen that is in the water entirely checks pitting and corrosion. It also disintegrates incrustation so immediately as to prevent its adhering to the plates. Not only is a great economy of fuel effected by keeping boilers clean, but the risk of having the plates burned is thereby obviated. It has been computed that ½ in. thick of incrustation causes a waste of 15 per cent. of coal; ¾ in., 50 per cent.; 1 in., 150 per cent. Thus the Preservative avoids the great risks which are inseparable from scaled plates, lengthens the life of a boiler, and covers its own cost a hundred-fold by economy of fuel. It is entirely harmless, and has no injurious action on metals. It can be put into the feed tank or boiler, as may be most convenient. Sold in drums and casks bearing the Trade Mark, without which none is genuine.

BELL'S ASBESTOS YARN and SOAPSTONE PACKING for Locomotives, and all Stationary Engines running at very high speed with intense friction.

The following Testimonial refers to this Packing:—
Festiniog Railway, Locomotive Superintendent's Office,
Festiniog, Pembrokeshire, January 13, 1883.

Mr. John Bell, 118, Southwark-street, S.E.
DEAR SIR,
I have much pleasure in saying that the Asbestos Yarn and Soapstone Packing gives every satisfaction; indeed, better than we expected. We have a locomotive packed with it, which has been running five months (and think of the piston speed with our small wheels). I think the Soapstone a great improvement, as it keeps the packing elastic, and prevents it getting hard. I am very pleased with its working, and also the very low price for such good lasting Packing. The Asbestos Yarn we find is very useful, and answers admirably.
Yours truly,
(Signed) W. WILLIAMS.

BELL'S ASBESTOS BOILER AND PIPE COVERING COMPOSITION, for coating every class of steam pipes and boilers, non-combustible and easily applied when steam is up; adheres to metals and preserves them from rust; prevents the unequal expansion and contraction of boilers exposed to weather; covers 50 per cent. more surface than any other coating, and is absolutely indestructible. It can be stripped off after many years' use, mixed up with 20 per cent. of fresh, and applied again. The composition is supplied dry, and is only to be mixed with water to the consistency required for use.

A Horizontal Boiler, 17 ft. 6 in. long, 15-H.P., gave the following results:—

Temperature on Plates - - - 196 deg.
" " Covering - - - 94 deg.

One ton of coal was saved per week, and although the fire was raked out every evening, 20 lbs. of steam were found in the boiler next morning.

The following Testimonial refers to this Covering:—

Offices of the Wimbledon Local Board, Wimbledon,
Nov. 28th, 1883.

DEAR SIR.—It may interest you to know that we save exactly 40 per cent. in fuel through using your covering.—Yours truly,
W. SANTO CRIMP, C.E., F.G.S.

BELL'S ASBESTOS and INDIA-RUBBER WOVEN TAPE and SHEETING, for making every class of Steam and Water Joints. It can be bent by hand to the form required without puckering, and is especially useful in making joints of manhole and mudhole doors; also for large "still" joints where boiling fat and steam have to be resisted. It is kept in stock in rolls of 100 ft., from ¼ in. (Fig. 6) to 3 in. wide, and any thickness from ¼ in. upwards. Manhole covers can be lifted many times before the renewal of the jointing material is necessary. The same material is made up into sheets about 40 in. square, and each sheet bears the Trade Mark, without which none is genuine. It is very necessary to guard against imitations of this useful material, and to secure themselves against being supplied with these inferior articles at my price, users are recommended to see that every 10 ft. length of the Asbestos Tape purchased by them bears the Trade Mark.

BELL'S SPECIAL LONDON-MADE ASBESTOS MILLBOARD, for Dry Steam Joints, made of the best Asbestos fibre, is well-known for its toughness and purity, and is absolutely free from the injurious ingredients frequently used to attain an appearance of finish, regardless of the real utility of the material. Made in sheets measuring about 40 in. square, from 1-64th in. to 1 in., and ¼ millimetre to 25 millimetres thick. Each sheet bears the Trade Mark.

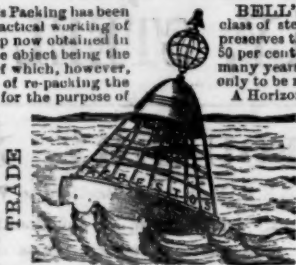
BELL'S ASBESTOS EXPANSION SHEETING (PATENT).

This Sheeting is another combination of Asbestos with India-rubber, giving to the steam user the special advantages of both materials.

The India-rubber Washer is protected from the action of heat and grease by an outer coating of vulcanised Asbestos Cloth, thus producing an excellent joint where expansion and contraction render other materials unserviceable.

This material is admirably suited to steam pipe joints and every class of valve.

Valves made of this material are very durable, as they are not subject to injury by oil.



The goods of this house are of the highest quality only, and no attempt is made to compete with other manufacturers by the supply of inferior materials at low prices. All orders must be sent direct to the under-mentioned depots and not through Agents or Factors.



FIG. 6.



FIG. 1.

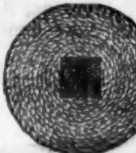


FIG. 2.



FIG. 5.



FIG. 4.

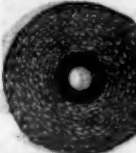


FIG. 3.

BELL'S "ASBESTOS LUBRICANT"

ILLUSTRATED PRICED CATALOGUE FREE ON APPLICATION TO

BELL'S ASBESTOS WORKS, SOUTHWARK, LONDON, S. E.

OR THE DEPOTS—

Victoria Buildings, Deansgate, MANCHESTER.

11 and 13, St. Vincent Place, GLASGOW.

39, Mount Stuart Square, CARDIFF.

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KING'S PATENT HOOKS AND AUTOMATIC LOWERING ARRANGEMENT.

Patents, 1879, No. 1105; 1882, No. 3021.

KING V. OLIVER AND CO., LIMITED.

NOTICE IS HEREBY GIVEN that by a Judgment of the High Court of Justice, dated 11th February, 1884, herein the Plaintiff was awarded damages for infringements by the Defendants of the above-mentioned Patents with costs, and also a Declaration by the Court that the Agreement under which the Defendants professed to act was null and void, and was so prior to the 23rd January, 1883.

(2) A Declaration by the Court that as against the Defendants the Plaintiff is the sole and exclusive proprietor of the said Patents respectively, and of all the licences and privileges thereby respectively given and granted.

(3) An Injunction restraining the Defendants from manufacturing, selling, advertising, or otherwise representing that they are entitled to manufacture or sell any Machinery, Apparatus, or Detaching Hooks protected by the said Patents or either of them.

AND NOTICE IS HEREBY FURTHER GIVEN that **STEPHEN HUMBLE**, of Derby, is the **SOLE AGENT** of the Plaintiff for the manufacture and sale of the above-mentioned Hooks, and the "Automatic Lowering Arrangement," protected by the 1882 Patent above-mentioned, for facilitating the lowering of Cage, and preventing delay in case of an over-wind, and that no other person whatever is entitled to MANUFACTURE or SELL the said Hooks and Lowering Arrangement, or any or either of them.

Feb. 13, 1884.

MOLE AND STONE,
Plaintiff's Solicitors, Derby.

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TIN, LEAD, AND COPPER MINES,

MILLERS, BREWERS, AND

MALSTERS,

COLLIERIES AND

QUARRIES,

COFFEE ROASTERS

AND

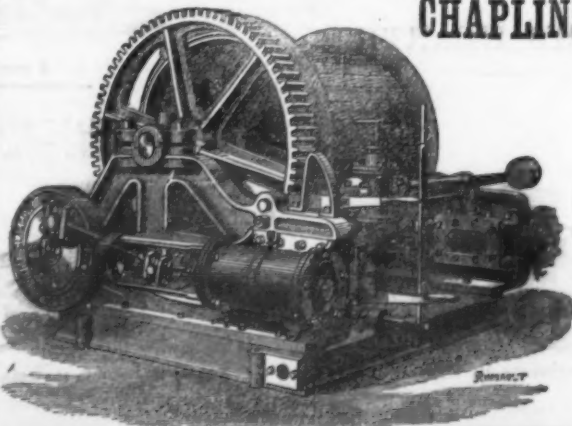
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CHAPLINS' IMPROVED WINDING ENGINES

With or without Boilers, specially adapted for Pit Sinking and other Hauling and Hoisting Purposes.

Leading sizes from 10 to 26 horse-power nominal.

PORTABLE WINDING ENGINES

On Carriage and Wheels,

With One or Two Drums, suited for Pit Sinking, &c.

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LONDON HOUSE,

63, Queen Victoria-street, London, E.C.

Original Correspondence.

A DISCURSIVE VIEW IN THE INTEREST OF MINING—
No. V.

SIR,—Political measures in mining are no less essential to its fullest success than are the fundamental sources from whence the staple of its wealth is derived. The terms of acquiring and the manner of operating such sources are vital to the issues resultant. Experience teaches that the earlier stages of mining development are the most prolific of profits, and that those who are identified with them at such stages as promoters and patrons reap the fullest reward. Not unfrequently have we seen advocated in the columns of the *Mining Journal* the impolicy—if not the imprudence—of “putting all one’s eggs into one basket.” The buying of high-priced undeveloped mines, whether all of one’s surplus cash goes into them or not, is no less impolitic. Take, for instance, a mining property which requires to purchase it 500,000. To be worth such a sum it ought to possess ocular and every other evidence, collateral and otherwise, of reimbursing the outlay in five years, which, when done, would be merely reinstating the capital so invested. Years more of similar prosperity would still be requisite to indemnify for interest at a fair rate on the amount invested, accrued, and accruing. It will readily be seen that none but mines prolific of wealth for a somewhat protracted period can be productive of such results; but there are mines which have yielded thus remuneratively, and others what are equivalent thereto, to individual investors, and for a much longer period of time than that above indicated; but such prizes have generally been purchased at their incipient stages for modest sums, and subsequently developed to their maximum and ultimate values.

The Richmond Mine in this State is a case in point. Its first cost, probably, did not exceed a tenth or even a fifteenth of what some later inflated bubbles have been purchased and launched at, some of which have already exploded, and others are on trial, with little or no prospect or hope of arriving at a different destiny. The Richmond Mine has yielded profits amounting to but little, if anything, short of a million pounds sterling in about 12 years on a capital of 270,000, and still the mine is extant, productive, and remunerative, with all its costly and valuable plant of machinery, reduction works, and refineries. What the Richmond has been and is, others may be, and become, some of which can be procured on terms equally modest, and much more advantageous to investors generally. What high-priced sensational scheme has ever or ever can be reasonably expected to equal the aggregate profits of 12 or 15 such properties as the Richmond, and that mine is not a solitary example of its class. There can be no comparison between the chances of making money or of the profits actually realised from such investments, and the high-priced, highly imagined, and audaciously pretentious schemes, elaborately manipulated on paper to captivate and ensnare idealistic spendthrift adventurers, the high-priced, high-strung, inflated class which find their way *en masse* into the markets of great cities. The really good and great are not subjected to that kind of appeal and transit. They are good enough to hold fast of, and are pleasantly gratifying to their owners, who usually pride themselves and assume individual credit for such a connection, a pardonable vanity, it will at once be conceded. It may be replied in extenuation of ill-success that the Richmond Mine is exceptional. In what it may be asked. Whether as to the mode of its working and manner of its development, or the abundance and quality of its ores. In the former sense it is one of a class decidedly exceptional. In the latter sense it is not so much so, but more so than it might have been or would be if many other mines had been acquired on similar terms and similarly vigorously and economically developed.

All mines are not alike as to their extent or capacity of productiveness, nor as to the amount of capital requisite to their development and efficient operations. If 20,000, constitute the working and reserve capital of one company, 30,000, that of another, and 50,000, that of a third, &c., and in each case the several amounts be amply sufficient for all needful purposes whatever, the percentage of profits in respect of each, all other things being equal, becomes at once the criterion of their respective values. If the percentage of profits on the more cheaply-acquired enterprise exceeds that of the other, it becomes for the time being the most valuable and lucrative investment; and if the evidences of its continuance are equal, it would probably be found permanently so, and paramount. Beyond this it is no question of *fac simile* correspondencies other than the naturally associated conditions contributory to the deposition of metallic ore in their variously formed receptacles and repositories; but it is a question of *E. s. d.* and the product of their prudent, successful, and satisfactory investment. There are more mines of the Richmond class—as to the percentage of profits of various calibre and individualities—awaiting development in this State, and, indeed, in this country, and whether the output respectfully proved to be greater or less, the profits proportioned to the capital would not be inferior.—*Ione, Nye County, Nevada, Jan. 21.* R. KNAPP.

OPHIR AND RUSH VALLEY MINING DISTRICTS—No. IV.
THE COAL FIELDS OF UTAH.

SIR,—The coal of Utah has a thickness of more than 200 ft., and lies along the eastern slope of the great Wasatch mountain range, forming an almost inexhaustible belt from the boundaries of Wyoming; through the Uintah Reservation, Pleasant Valley, on Huntington Creek, Castle Valley, down to Kanab and Panguitch. There is excellent coal on Weber river and its tributaries for 10 to 15 miles above Echo. These Weber river coal mines have been opened and developed during the last 15 years to a depth of 1000 ft., disclosing immense bodies of coal to work upon for 50 generations to come. This coal is excellent for fuel in general, and engines in particular. The Weber river coal beds are from 1 to 7 ft. in thickness. A short railroad connects the mines with the main line and with Park City. Experiments have demonstrated the fact that this coal is of a non-coking character, and hence of little use in connection with the smelting of Utah Territory.

To the north and north-east in Wyoming are still further deposits of a similar lignitic character. The principal coal mines there are those at and around Rock Springs. These mines are worked by 300 white, 300 Chinese miners, and 250 labourers, making a total of 850 men. The production varies from 1400 to 1800 tons daily. As the coal is very soft, one-fourth of the amount produced goes into the slack pile.

In No. 1 shaft an incline, at an angle of 13°, has reached a depth of 3300 ft., from which said incline levels ran for a distance of nearly 3000 ft. each way. This space has been worked out to an extent of a little over one-half. The excavations are 20 ft. wide, and create safety pillars of the same width. The coal bed is 8 ft. thick. One half mile north of shaft No. 1 is shaft No. 2, which is situated above No. 1, and is worked in the same manner as shaft No. 1. The coal bed is a little less in thickness than that of No. 1. No. 3 is opened by an incline shaft to a depth of 3600 ft., on a coal bed 6 ft. in thickness. It is worked the same as No. 1 and No. 2, except that no pillars are left and all the coal is extracted. No. 5 has a 5½ ft. seam of coal, containing two thin seams of fire-clay. No. 6 has been opened on a 12 ft. coal bed, dipping north-west, at an angle of inclination of 40°. This coal bed has been traced for six miles.

Eighty to ninety miles south-east of Salt Lake City in San Pete Valley, a number of seams from 6 in. to 6½ ft. in thickness, of excellent bituminous coal has been found, while a little farther to the east and south-east among the mountains, others as wide as 10 or 11 ft. are worked. The coal is of dark brown colour near the surface, and deeper down of a dull black colour; by distillation it makes an excellent coke, as has been amply demonstrated by using the same in the Utah smelting-works. All what the mines require is a better and more practicable plant for washing and coking. The San Pete Valley Railway Company owns eight miles along the strike of a 4 ft. vein or seam of coal, comprising 18,350 acres of coal land. The analysis of the San Pete coal yields as follows for coke:—Moisture, 1.8; bitumen, 34.2; coke, 60.7; ash, 10.3 per cent. The coal field in Pleasant Valley is even more extensive than that of San Pete Valley. The Castle Valley coal field adjoins the Pleasant Valley on the south,

and Pleasant Valley adjoins San Pete Valley on the east. The Union Pacific Company have opened a large coal mine in Pleasant Valley on a very extensive scale. As yet little is to be said of the large coal beds in Iron County, and those further south, which are from 6 to 13, and more, feet in thickness. These coal beds wait for railroad facilities. It is estimated that the coal resources of Utah comprise an area of 20,000 square miles, and with this fact in view we need have no apprehension of and for the future, and the time is rapidly approaching when Utah will be as a coal producer the rival of Pennsylvania. The principal and only dealers in Utah coal are Messrs. A. Gould and Williams, residents of Salt Lake City; both are enterprising and active business men. A. Gould is known to everyone of Utah, not only as stated above, but more as a man of the utmost kindness and benevolence to the poor—courteous to all alike. May he prosper in wealth and years of health! In the San Pete, Pleasant, and Castle Valley, already mentioned, in the sandstones and conglomerates with the coal, and near to the same, ore beds of shale containing jet, ozocerite, albertite, and almost enough oily matter to burn alone, while in the vicinity are springs, bringing to the surface considerable quantities of petroleum. Further to the north similar shales appear. In view of all these facts, it is not improbable, but sure, to suppose that oil must and will be found upon search being made that Utah may yet supply at least her own markets. To aid the miner and prospector I will here add a description of jet, ozocerite, and albertite, the latter of which is found in great quantities in south-eastern Utah, 200 miles distant from Salt Lake City. Jet or gaggates is a very valuable mineral; it is in part a true lignite, it is light, looks much like smooth, black, glistening wood, is combustible, and emits a disagreeable odour when rubbed, and burns with a smell of sulphur. It has been found in Hungary, Syria, in the rocks of Mount Lebanon, near Beirut, in beds of coal in Asia Minor and Burma, and in Utah.

Ozocerite (native paraffin in part) is like wax, spermaceti, butter-like, consistency of soft tallow; colour greenish, wax yellow, yellowish brown, to brown and brownish black, often having a greenish opalescence, translucent, greasy to the touch; fusing point 56° to 63° Celsius; colourless to white when pure. Ozocerite is partly wholly soluble in ether, and gives a yellow or yellowish brown solution; it is also soluble in oil of turpentine and naphtha, and a little soluble in alcohol. Ozocerite occurs in and associated with beds of coal in Utah, Burma, Slank, in Moldavia, Boryslaw, in Galicia, beneath a bed of bituminous clay shale; in masses of 80 lbs. to 100 lbs. at the foot of the Carpathian mountain range; Gamsing, in Austria, in Transylvania, near Moldavia, in the Carpathian sandstone, at Uphall, in Linlithgowshire, Scotland. It is used for the manufacture of paraffin.

Albertite (Melan asphaltum) occurs as filling irregular fissures in rocks of the lower carboniferous or subcarboniferous age in Utah and Nova Scotia. It has H 1—2; G = 1.097; lustre brilliant and pitch-like; colour brownish black to jet black. Softens a little in boiling water, shows incipient fusion in the flame of a candle; only partly soluble in alcohol and ether, more in oil of turpentine (about 30 per cent.) Is on exhibition in the Mining Institute and United States Surveyor General's office at Salt Lake City. It is used in the manufacture of asphaltum and gas.

W. BREDEMAYER, M.E., U.S. Surveyor.

Salt Lake, City, Jan. 25.

NOUVEAU MONDE GOLD MINING COMPANY.

SIR,—Referring to the letter of Mr. Joseph Nelson in last week's *Mining Journal*, I think that the majority of your readers will agree with me that the premises Mr. Nelson advances, as a reason for persons “to shun connection with it, as with the plague,” (thereby meaning the Nouveau Monde Company) are scarcely such as to commend themselves to common reasoning. I claim to have some knowledge of the history of the Nouveau Monde Company, and am likewise a large shareholder; but that its history “surpasses anything to be found in the Arabian Nights, and discloses the astounding fact that its administrators have shorn the public in every quarter of the globe,” is a draft on personal imagination, which few readers, having any knowledge of the facts, will be disposed to accept. What does Mr. Nelson himself state in his letter, when shorn of its fanciful imagery? He says, that after the year 1848 the company was started to acquire a property in California; that, owing to disputes and litigation, carried on for many years, no legal title to any gold-producing mine in California was ever acquired. The Gérant kept the company alive, and, after many years, entered into negotiations for the purchase of a gold-producing property in Venezuela; raised a sum of 20,000, with which he secured to the shareholders of the Nouveau Monde Company a substantial interest in the property—in other words, gives vitality to an all but defunct company, and for the doing of this all Mr. Nelson can say is, “to shun connection with it as with the plague.”

I may say that the Nouveau Monde Company was actually brought out in Paris in the year 1851, under the French law of commandite. The capital, as stated on the share certificates, is 5,000,000 frs., in shares of 25 frs. each. No shares have ever been issued to replace those known to be lost, and the Gérant has no power to increase the capital or to issue any shares without the same formalities being gone through as would be similarly required under English law—by a general meeting, &c.

For many years the Nouveau Monde Company was not spoken of in London, and the Gérant might have allowed it to die a natural death, and the holders of shares would not have felt the loss; but the Gérant did not do so, but occupied himself in the endeavour to acquire a property which has resulted in giving to the Nouveau Monde shareholders a substantial interest in a gold-producing property, which, in spite of what Mr. Nelson says, is acknowledged by all persons capable of forming an opinion of such properties to be very valuable. What Mr. Nelson, indeed, states about the Nacupai property is entirely in accord with his other statements, and if his letter had been signed otherwise than with a name I should have been disposed to think it written by a person largely interested in the adjacent property to the Nacupai, as, otherwise, I could scarcely reconcile the purport of his communication, for it does not seem to me to advance any other interest.

From whom he has been creditably informed that the Nacupai Company has no good title to their property will, no doubt, remain a mystery; but I will venture to say that upon this he has been misinformed, and I will tell him why I say so. The property, as Mr. Nelson himself states, was offered for sale. By whom? By the Bankruptcy Court having possession of the title. From this Court the property was purchased, and clear title given to the purchaser. The purchasers, by their agent, received possession of the property itself, paid the dues, and registered the titles afresh when called upon to do so. How, then, can it be said that the Nouveau Monde Company are not the original purchasers, and that the present Nacupai Company are not legally in possession. It is true that the Chile Company are attempting to get possession of No. 9 section of the property, and have been working on this section for several months, and extracting thousands of ounces of gold therefrom; but the day of reckoning cannot be far distant, and we shall then see whether all sense of right and justice have been thrown to the winds by the Venezuelan Courts. I think a good story could be told in regard to the bribery that has been going on in connection with this matter, and sooner or later it will all appear. Everyone acquainted with the country knows that bribery is one of the characteristics of official life from the highest to the lowest. All I would say in regard to this section No. 9 is this—If the Chile Company considered it to be their property, how does it happen that negotiations were actually set on foot by them for purchasing the same from the Nouveau Monde 12 months ago?

This No. 9 section is situated six miles from the Nacupai workings, and owing to its distance it was not looked after in the early days of possession, and this I expect led the Chile Company to go on in the way they have done; but, Sir, assuming that even this section were lost to the Nacupai Company, the company could afford to let it go, as between that and the Nacupai Mine are many other sections equally rich, and only requiring opening out. Mr. Nelson finds fault with the capital of the company, and calls it “stupendous.” I, for one, entirely differ from him in that view. It appears to me of

no great moment whether the capital be 200,000, or 600,000, when such capital is principally divided between the vendors. The Nouveau Monde Company now take as their proportion 150,000 shares. Had the capital been made 300,000 the Nouveau Monde Company would only have received 75,000 shares, and whatever dividend might be earned would be payable in just the same proportion. If I receive 10s. dividend on one share or 5s. dividend on two shares it makes very little difference to me. I receive 10s. in each case, my interest remains the same. The public have not been asked to subscribe the 600,000, of shares. That makes the difference.

Well, Sir, I take it that far from the shareholders of the Nouveau Monde Company having any cause of complaint against the Gérant, I think they owe him a debt of gratitude, and had the shareholders responded to his call for assistance in 1881 to subscribe 60,000, only the shareholders would this day have been in the happy possession of the Nacupai property, and each Nouveau Monde share would have stood at 5l. or 10l. apiece, instead of at its present price. I feel sure, Sir, that no one having any knowledge of the Nacupai properties, will endorse the gloomy views of your correspondent. The El Callao only came upon the rich deposits at a depth of 600 ft. The Nacupai has only as yet reached some 200 ft., and from that depth are taking 650 ozs. in 12 days' working. What they will do when they get lower down time alone will show; but as the workings are similar in all respects with the El Callao, what one mine can do the other, so far as human knowledge can guide, is bound to do. It is said that “l'expérience est la maîtresse des fous,” and so it often proves.—*Palmerston Buildings, Feb. 12.* A. C.

FRONTINO AND BOLIVIA GOLD MINES.

SIR,—In last week's *Mining Journal* “Reciprocity” says:—“It is useless to refer to what is done in Australia, for the Frontino mines are in a very different district.” Will the writer of this explain what he means? Wages at the Frontino mines are less than half what they are in Australia, and in the latter country they seldom get any assistance from water-power, which they do at some of the Frontino mines. In a well-managed Australian mine they make about 3 dwts. of gold per ton of quartz crushed pay expenses, all beyond that being clear profit. Now, “Reciprocity” gives the yield of the Frontino mines for the month of October and November last at 3469 tons, yielding 12½ dwts. per ton—equal (say) to 8½ dwts. of Australian gold in value. Therefore, in Australia the above yield would have given a profit of over 3000, instead of only 349. Will “Reciprocity,” or some one connected with the Frontino and Bolivian management, kindly explain how this is? ENQUIRER.

GOLD AMALGAMATION.

SIR,—Anything I have stated in the *Mining Journal* is to the best of my belief founded on and is fact. I really cannot see what use there would be in repeating my statements. As a matter of fact I have not seen the wave-plate amalgamator in operation, and, therefore, I cannot I fear convince Mr. Readwin in the way he mentions in his letter of the 9th inst. In one of my recent letters I gave names and addresses of practical men who not only had seen it in operation but had one or more of these amalgamators in use at their mines. Anyone who cares to investigate, therefore, has the same chance that I had. Of course knowing these gentlemen personally lent additional weight to their testimony, as I found them to be thoroughly experienced and competent.

My sole object in writing to the *Mining Journal* was to make public what I consider to be confirmatory evidence of certain statements made by Mr. Moon, which were apparently thought to be somewhat exaggerated. Whether I am right or wrong in my conclusions time will prove. I have no wish or inclination to enter into any argument on the subject, and I may add that it does not matter to me whether or no any individual believes in the amalgamator. When these machines are put on the market, which I believe they shortly will be, they will speak for themselves.

Old Broad-street, Feb. 14.

M. PARRY GOSSET.

FAIR TRADE AND FREE TRADE.

SIR,—The reasoning of Sir R. Cross as related by your very able correspondent “Argus,” is a fair specimen of Cobdenite argument. Having, however, no grounds upon which to found any sound argument the Cobdenite can but re-echo the howlings of Mr. Bright, a man indeed of most wonderful eloquence; but then his orations are destitute of logic, and ever ready to speak he does not appear ever to have been capable of thought. Resolved to cut down Protection utterly he gave not a thought to the future. The future, however, came upon him, and has falsified every one of his confident vaticinations. Incapable of giving any reason for the mighty sham which he advocates he falls back upon noisy and abusive assertions.

I am as old as he is, and though no demagogue or “people's tribune,” as in defiance of common sense it delights the many to term him, I am still able to look at things as they have been and as they are, and I confidently assert that though great distress at times prevailed under Protection, or rather under Prohibition, still there is more distress, misery, and semi-starvation in England now than there ever has been before during this nineteenth century. Mr. Bright who never troubles himself about careful thought, but who is ever ready to burst into a torrent of verbiage, is unconsciously a powerful advocate of Protection—that is, he protects the foreign masters and their workmen at the expense of his own countrymen with the most zealous care. He has made England a vast shop counter furnished cost free to every nation under the sun on which to display and vend their cheap wares, so as to ruin home industry, taking the bread of the British workmen and giving it to aliens, whilst crippling the employers of labour, so that trade is either paralysed or rendered profitless; whilst as it becomes impossible for the home producer to meet this foreign competition, he can only live by means of dishonestly depreciating the intrinsic value of his productions. Commercial dishonesty now so fearfully rife is the offspring of the Cobdenite sham. And what is the pretext or excuse for this terrible destructive policy? It is that consumers may get everything they require at a minimum price. Now minimum prices mean minimum profits or actual losses, and, therefore, entail a minimum power of wage paying, or no such power at all if the madness is pushed to its maximum.

The wealth and happiness of a nation is not solely dependent upon minimum prices; it rests upon the full and constant employment of every human being capable of working, and upon the payment to each such worker of fair and sufficient wages. As long as England is the rent-free shop or counter of all nations this happy state of things can never exist. Mr. Bright, therefore, and his Cobdenite brethren—men of one idea and that a wrong one—are actually powerfully and most unhappily successfully protecting all foreigners at the expense of British capital and labour—in fact, we are paying not our own taxes alone but the taxes of foreign nations. And this sickening folly, so transparent that a smart boy of 10 or 12 years old could see through and through its glaring fallacies, is held up by men high in position, and often otherwise great in mental abilities, as a something to be almost worshipped, as the very essence of the concrete wisdom of all ages which at the appointed time entered the brains of Messrs. Bright and Cobden and their partisans, and was there enshrined, never to be doubted but to stand unquestioned for all time. Why the self-conceit of the Cobdenites is, as it were, the eighth wonder of the universe. They deem that the whole world is steeped in dense ignorance and blind folly, because the world (England excepted) protects its home industry and its home labour. All wisdom centres in the Cobdenites; without are only fools and madmen, working out their own destruction.

Tobacco is not a necessary of life, but if it cannot be dispensed with why not grow it at home, and increase the duty upon foreign tobacco? The Cobdenite axe strangely enough spared the duty on tobacco when Protection was led to the block. Mr. Gladstone is eloquent on jam. He wants the farmers, the “jam-jam” as I may say, to grow jam fruits. Why should they not grow tobacco? It was once cultivated to a considerable extent round the ancient town of Tewkesbury; but the Legislature, anxious to defend the interests of slaveholders abroad, forbade this cultivation. Grown in England,

where it thrives, it is milder and less narcotic than the foreign weed. Then jam puts one in mind of sugar, and why should not the farmers grow beet-root and make sugar as the French do; and so, protected by a duty on the French article, enrich the country by home labour, and themselves by the employment of that labour? Thousands of British workmen from the sugar-works were cast adrift at a moment's notice, in order that Frenchmen might eat the bread which by right and in justice belonged to the former.

Feb. 11.

RECIPROCITY.

ENGLISH TRADE, AND FOREIGN COMPETITION.

SIR,—Many who have thought that Free Trade is a settled question in England will, perhaps, be startled to learn that Preston has returned a member to Parliament pledged to the principle of Reciprocity. Notwithstanding all the efforts of the Free Trade League, a bold manifesto from Mr. Bright, and other manoeuvres, the electors of Preston returned him by a great majority. The Times has also acknowledged that it is evidently becoming necessary to "fight the whole battle of Free Trade over again;" and Mr. Gladstone said to a deputation representing the Trade Councils of various great centres of population and industry, who protested against bounties, prohibitive duties, and one-sided Free Trade, that "he did not regard with any satisfaction the system under which an artificial advantage is given in our markets to the product of foreign labour, the principle to be observed being that of equality. Some say it is a good thing because the consumer gets the benefit of it, but he did not think that any benefit, founded on inequality and injustice, could bring good, even to the consumer." This is plain speaking, and if Mr. Gladstone's equality is not reciprocity it is wonderfully like it.

The facts connected with the development of Free Trade having proved so contrary to the theoretical proclamations of public orators the time is fast approaching when the whole question will have to undergo a thorough investigation. Take, for example, the theory of Mr. Cobden himself that if we bought commodities from America the Americans would be obliged to take our manufactures in exchange, and what has been the result? England buys commodities from America of the value of 90,000,000*l.* per annum, whilst all our exports put together do not exceed 23,000,000*l.*—not enough to pay for the simple grain alone. Take another instance of the crushing effect of one-sided Free Trade.

France, in her negotiations for the renewal of the Cobden Treaty (a reciprocity treaty) has introduced a new scale of duties on English goods, ranging from 7 to 200 per cent, and on certain kinds of woollen 210 per cent. On most of our cotton manufactures the increase is 150 per cent. This is the kind of Free Trade England has to deal with, and treaties are entered into with France and Spain for the importation of cheap insipid wines, to be introduced into private families through the medium of grocers' licenses, to the encouragement of national intemperance, whilst the legitimate publican is to be annihilated, and his property confiscated.

Mr. Eckroyd, the member for Preston, sums up the general effect of the present system of one-sided Free Trade in a few words. He says—"The nations from whom we chiefly purchase our supplies of food, and who, until the past few years, took large quantities of our manufactures in payment, will no longer do so. They have shut out our goods by heavy duties, and by thus excluding us from competition have encouraged the extension of their own manufactures until they can supply themselves. Thus the English workman's employment, by which he earned the money to pay for his imported food, is taken away from him, not by competition, which he would gladly meet, but by forcibly excluding his goods by the action of tariffs."

The English workman has to endure all this mainly for the sake of the big loaf held so enticingly up to his view by visionary politicians, but which loaf for 19 years before the adoption of so-called Free Trade only cost about 4*d.* a quarter loaf more than it does now. Besides the English workmen, capitalists, yeomen, and commerce generally, including agriculture, manufacture, and English mining in its various important branches, all suffer in this single-handed struggle against the high-handed crushing tariffs of other nations, whilst foreign commodities are permitted to roll mercilessly in duty free to swamp the industry and capital of our native land.

Tavistock, Feb. 12.

FAIR TRADE.

CHEAP METHOD OF TREATING AURIFEROUS ALLUVIALS.

SIR,—I have read with much interest your remarks in the *Mining Journal* of Jan. 19 on the adaptability of the Ball dredging apparatus to the treatment of auriferous gravels; and I thoroughly endorse your suggestion that gold containing alluvials, whose situation preclude the employment of hydraulic jets, for the disintegration and removal, could be treated rapidly and very economically by the Ball dredge. I have inspected professionally many of the best gold fields of South America, and I have seen few deposits of auriferous gravels that offered the conditions necessary to make hydraulic mining successful. Almost invariably when a good fall for tailings existed there was neither quantity nor pressure of water procurable, and *vice versa*, and if the primary conditions for using this power, *via* great pressure for jets and rapid fall for tailings, were obtaining, the cost of cutting canals for long distances, driving tunnels, forming reservoirs, or erecting flumes, appeared to me in each instance too great to warrant my advising their construction.

Now, if a 10-horse power nominal engine, driving a simple machine, can lift 100 tons of auriferous gravel per hour, or (say) 1000 tons per working day, it should work in most instances infinitely cheaper than hydraulic mining, even under exceptionally favourable conditions, and it has this advantage that returns should commence immediately that the dredge is erected, whereas the delay in constructing long canals, flumes, tunnels, and reservoirs necessary for hydraulic mining is generally very great, and time, need I say, means money. Apart from the apparent simplicity of a mining operation with the Ball dredge, this apparatus appears to me to suit exactly the most difficult circumstances. The feed pipe, being constructed with flexible joints, works round boulders and rocks in river beds, and the pump, besides sucking up 100 tons per hour of coarse gravel, actually ejects this same stuff to a distance, if necessary, of several hundred yards. Now, it is notorious that the beds of rivers flowing through an auriferous tract of country are often exceedingly rich in some part of their course; but it is also notorious that deviating rivers or "wing damming" river beds is exceedingly expensive work. With the Ball dredge it appears to me that river mining, from being the most expensive heretofore, will become the cheapest form of mining in the future; for I see by Mr. Langley's paper that the cost of dredging coarse gravel with this apparatus at Lowestoft, and disposing of the spoil, was under 3*d.* per ton, and it is needless to say that there are few auriferous river bed deposits that would not pay for extraction at double the above rate. I also note that the Ball dredging apparatus can be worked from the bank resting in a wagon, or from the surface of a river resting in a pontoon.

I have examined both in the high plateau of Brazil and in the eastern slope of the Andes several heavy deposits of rich auriferous debris; but owing to the want of sufficient fall for tailings I was obliged to report unfavourably on them. Had the Ball apparatus been then invented I would assuredly have advised my clients to develop those deposits; for with a small stream of only a few tons per minute on to them this apparatus could rapidly excavate a pond large enough to float itself and its gold-saving (fluming) pontoons. The pond excavated and the pontoons erected, the auriferous gravels extracted forward could be tipped back again into the pond after the gold was freed in the riffles and flumes, and the dredge would eat its way through in sections of the deposit. Should the debris thrown off crowd in or interfere with the working of the pontoon, a small extra apparatus could lift a part of it, and throw it bodily out of the pond.

In another case which I recollect in Bolivia the "dump" or fall for tailings existed; but there was no height or pressure of water obtainable, though the water was abundant. This case seems to me to have suited admirably the Ball apparatus, for it seems to eject with perfect facility and to long distances the gravels it lifts.

In conclusion, I may add that I have paid two visits to Lowestoft to inspect the Ball apparatus, and that some of my friends, acting on

my advice, propose sending one of these machines immediately to South America.—*Baywater, Feb. 11.*

A. T., M.E.

THE PROMOTION OF LEGITIMATE MINING.

SIR,—I quite agree with your correspondent "J. F." as to the desirability of shareholders having more satisfactory arrangements with vendors, and am of opinion that if the basis of such arrangements were that the vendors should be paid a fixed sum of cash and a certain number of shares given them upon a fixed quantity (or value) of ore being raised to bank, the result would be satisfactory and fair to all parties concerned. An arrangement similar to the above has been concluded in the case of the Hardshins Mining Company situated in Teesdale, where the vendor is paid all actual outlay to date of company taking possession, and on lead ore representing a certain value being brought to bank he is to be allotted a certain number of fully paid-up shares, but half of such number of shares are not to be issued to the vendor, nor disposed of by him, until the expiration of two years after allotment, unless the directors, other than the vendor, if he be a director, shall determine otherwise, and issue them, or part of them earlier; and be paid a fixed sum in cash payable at 6, 12 and 18 months' date, such fully paid-up shares only to have dividends equal with shares issued to ordinary shareholders, and not on the fully paid-up capital, until all other share capital is also fully paid up.—*Newcastle-on-Tyne, Feb. 11.*

W. S.

MINING IN IRELAND.

SIR,—I derived considerable pleasure by reading in last week's *Journal* the gratifying account of the success which has attended the search set on foot by Capt. W. Thomas in 1843 for valuable copper lodes in Cork and Kerry. It has been my privilege to meet the veteran and vivacious captain on various occasions during the past few years, once with a man upon whose movements all eyes in Europe are at this moment fixed—the illustrious "Chinese" Gordon—in whose charming company we spent several days, and who was delighted with the captain's experiences of the West of Ireland, extending to a period prior to the great famine. When leaving, the Colonel handed the old gentleman a souvenir, remarking, "You ought to have been Sir William Thomas 30 years ago."

I have just returned from the district in which the mineral wealth indicated in your article is situated, and I can without the slightest hesitation confirm all that has been written respecting its immense value. I accompanied Capt. Thomas to the South Berehaven Mines, and descending with him saw the miners breaking the rich copper ore. I brought specimens with me to London equal to anything of the kind contained in the School of Mines, Jermyn-street. Capt. Thomas informed me that the staff they are now getting out gives up to 40 per cent. of copper, with several ounces of silver, as assayed by Messrs. Johnson and Matthey, the assayers to her Majesty's Mint and the Bank of England.

Why, Sir, if this property existed anywhere else than in Ireland there would be a rush for claims similar to that which took place in California and Australia during the gold fever. The most eminent geologists and mining engineers concede that the mineral resources of Ireland are practically inexhaustible, while the richness of the products—especially in the county of Cork—have never been in dispute. According to Prof. Jukes, pronounced by him in the Government Geological Survey, the copper is deposited in beds of grit and slate, from 300 to 400 ft. thick over all the Kilcrobane district, and in quality bears comparison with the richest in the world. As proved by the Swansea Sale List, it realises a price double that of the ores from the best mines in Cornwall. Notwithstanding these and numerous other facts that might be mentioned respecting the sleeping wealth of Ireland, mining in that country has suffered, and is still suffering great neglect.

Fortunes could be reaped at home before the very eyes of capitalists at a comparatively small outlay, while millions of British money are sent to and lost in Africa, America, India, Mexico, and other distant parts of the globe, where investors can exercise no control over expenditure, and as to the value of the property have to depend upon reports, the truthfulness of which they have few, if any, means of testing. In the face of all this, known rich districts, such as South Berehaven, are overlooked by capitalists, who need incur no risk whatever before parting with their money. The properties can be reached from London in a few hours, and as the distance is nearer the Metropolis than Scotland or the Isle of Man the expense of the journey would be much less than is usually involved in a pleasure trip of a few days. There is a golden opportunity for the safe investment of capital in Ireland not to be found elsewhere, and yet it is thrown aside. The whole thing is an enigma.

Then there is another phase of the question. If some of the patriotic members of the Legislature, who are wasting their energies and money upon Utopian schemes with a political tendency, were to direct their attention to the development of the industrial and mineral resources of their own districts, it would redound to their credit, bring them substantial pecuniary profits, and benefit the nation at large. It is said that a company is to be formed to work the South Berehaven property energetically and systematically. If so, surely no mining enterprise ever commenced operations under more favourable circumstances.

GEORGE BALDOCK.

Tottenham, Feb. 14.

GREAT DINORBEN STONE AND MARBLE QUARRIES.

SIR,—It will be interesting to many of the subscribers to your widely-circulated *Journal*, who are acquainted with the Isle of Anglesea, in the present depressed state of the great copper mines there to hear that another great source of employment has sprung up, and will rapidly increase in extent in the north of the island, through the opening out of the above-mentioned quarries. Anglesea has long been famous as possessing at one time the greatest copper mines in the world; it is now more than probable that within the next two years it will become equally celebrated for its stone and marble quarries. Although Anglesea is the only county in North Wales at all famous for the production of marbles and carboniferous building stones, it is only within the last 18 months their beauty and really intrinsic worth are beginning to be fully acknowledged and at all adequately appreciated. This highly important and desirable object has been brought about through the enterprise, energy, and capital of Captain N. Farnsby Mills, R.A., of Westminster, who during the last 18 months has occupied himself in fully demonstrating, with the aid of a large expenditure, the value and capabilities of the property, which embraces no less than 136 acres, more or less overlaid by upwards of 100 regular beds of limestone and marble, which vary in thickness from 6 in. to as many feet, and rising (within the limits of the property) to an altitude of nearly 500 ft. above high water, having a vertical face of rock of 250 ft. immediately in front of Red Wharf Bay, with an unbroken longitudinal continuity of over 1000 ft., thus displaying or bringing into view an area of exposed working face of rock of the extraordinary extent of upwards of 360,000 ft., upon the development of which the quarrymen can at once operate.

Since the property passed into the hands of Capt. Mills he has had every available bed distinctly tested, the result being that a combination of beautifully figured and variegated marbles have been discovered, surpassing anything of the kind yet discovered in the United Kingdom. To give effect to these marbles a hall table has just been manufactured at the works, constructed entirely of Dinorben marbles, the table consisting of upwards of 400 pieces. This table is now being exhibited at the principal shop window in Castle-street, Beaumaris. So attractive is the beauty of this piece of native production that the window has been constantly surrounded by crowds of spectators, and the shop has been visited to view the table by persons from all parts of the island and neighbourhood.

The development in situ of these marbles, however, will be merely an auxiliary to the general development of this gigantic quarry site. The staple trade of these quarries will be more in the supply of stone for the construction of engineering, canal, dock, bridge, sea walls, embankments, &c., and for the more superior class of public and private buildings, both for ordinary ashlar, quoins, and other exterior stone dressings, as well as for the more delicate and elaborate embellishment for interior work. In addition to these sources of revenue there is, it seems, an unlimited quantity of very superior

limestone for chemical, blast-furnace, and other purposes. So pure is this stone, and superior to others now in use, that enquiries have already been made for a supply of 100,000 tons within the ensuing year. There is a natural harbour on the property, in close proximity to the works, which will shortly be made more effective and complete by the construction of a stone pier (now being formed) about 400 ft. long, when steamers of 1000 tons burden could when desirable be loaded with great dispatch. It is contemplated to erect in the meantime a wood jetty, specially for the delivery on board of the limestone for fluxing and chemical purposes. This will be run out immediately beneath the quarry face, and enable the stone to be put f.o.b. at about 7*d.* or 8*d.* per ton, so abundant is the stone and means of getting and delivering on board.

These quarries are expected within the next seven or eight months to afford employment to at least 150 hands, which will be gradually increased as the works developed. The quarries are situated only four miles from Beaumaris, the freehold of which belongs to Lady Neave, and the original lessee was Mr. Edmund Spargo, civil engineer, of Liverpool, a gentleman well known to most of your readers, and still better known to the labouring class of North Wales, particularly Carnarvonshire and Anglesea, to whom, through capital primarily introduced by him, an enormous amount of employment for a great many years has been afforded.

MONA'S ISLE.

LEAD AND BLENDE MINING IN THE LAKE

DISTRICT—No. II.

SIR,—May I again ask the favour of a space in your next *Mining Journal* for a few more particulars on the above subject? At the Threlkeld Lead and Blende Mine, situated in the slope of Saddle-back Mountain, large quantities of lead and blende are being raised. I am informed that two lots, together about 125 tons, are now being delivered, and the mine looks extremely well. The way in which this mine is opening out must be very gratifying to those who recommended its re-opening, it having stood abandoned for many years until the present company took it in hand. I am assured that there are immense reserves of ore in the mine, and that it is likely to be permanently rich. In passing through Keswick I noticed at the railway station, a powerful pair of engines and boiler being unloaded; on enquiry I found they are for the celebrated Brandleigh Mines, and are about to be erected there for the purpose of pumping out the water. I learn that the work at the mines is progressing rapidly, and that a short time will see them drained, and in full work. This company is in the fortunate position of not having to seek for lead, as it is a fact well known to every old miner in the district that the bottom level of the mine contains a mass of pure lead ore, such as is rarely seen in this or any other district; it is, therefore, an absolute certainty that with proper machinery and efficient management this must be a stable paying concern.

At the Thornthwaite Lead and Blende Mine the engine is idle, and the mine filling with water, pending arrangements being made for the erection of a water-wheel for pumping. I am informed that the mine looks well, and that there are valuable veins of lead and blende discovered. At the Barrow Mine (a continuation south of the Thornthwaite vein) a level is being driven from the new engine pit (I believe 20 fms. deep) to intersect the vein, and which it is daily expected to accomplish. This mine I consider to be a first-class speculation, as lead in quantity has been raised from surface works in close proximity to the shaft, and nice specimens of ore are to be seen at the pit mouth, which have been got from strings passed through in sinking and driving.

I had hoped in this letter to have been able to announce the commencement of active operations at the Yewthwaite Mine, but up to the present nothing is being done. This, too, is a very valuable take, and contains the same vein as the Barrow and Thornthwaite Mines. Large profits have been made by former workers, and the old miners who worked there last inform me there is grand ore in the bottom, and also good headings of lead in the adit level, available for making sales immediately the company made a start.

Feb. 11.

SKIDDAW.

LEAD, AND ITS PROSPECTS.

SIR,—The question often suggests itself to me, why, the present depression in the price of lead now and for the last two or three years? Is it that the supply is so much greater than the demand, and that lead is now being actually imported at a greater rate from abroad than was the case four or five years ago? That our own home mines are not producing more is a fact patent to all; but apparently foreign supplies are the great bugbear which I conclude must have greatly increased to cause the late almost panic price of lead ore, now to be obtained at 11*l.* 15*s.* for China, and 12*l.* 2*s.* 6*d.*, or lower, for English pig lead. Possibly some of your readers may be able to enlighten me on the subject of supply and demand; also as to the present stocks of lead now on hand in comparison with those of former years, when the price of lead ranged from 15*l.* to 20*l.* per ton.—*Dorchester, Feb. 13.*

F. A. S. C.

MINING, AND WHERE TO INVEST.

SIR,—We frequently see in perusing the *Mining Journal* complaints of disappointments in investments in mines, and unless people are more particular where they invest there will be no end of complaints. If intending investors would peruse the reports from the agents, they will see that the mines are 200 fathoms, 300 fms., and some 400 fms. deep, and the lode 4 ft., 5 ft., or 6 ft. wide, and worth 5*l.*, 6*l.*, or even 9*l.* per fathom. Even if the lode should be only 4 ft. wide, and worth 9*l.* per fathom, it cannot possibly pay the working expenses. I have known many mines pay well when very shallow. I recollect when South Caradon paid thousands of pounds from the adit level. I know a young mine now opening up a parallel lode to South Caradon with every indication of like result, as the lode is large, and the ore of high percentage.

There are young tin mines in the district that are sure to be in the Dividend List ere long. There is a great cry, "tin is so low, it cannot pay for working," but before passing such remark, look first to the situation of the mine. I have worked on tin as tributary when our tin sold at 35*l.* per ton and arsenical mundic worthless. Now, we have young tin mines in the district that will pay for working for the arsenic alone, yet rich in tin, and with water-power to any extent. The great mistake of late is people rushing into concerns where exorbitant purchase-money is paid. It is to be hoped that mining has seen its worst days, and I hope shortly to see higher standards.

Callington, Feb. 13.

JNO. BUCKINGHAM AM.

EAST WHEAL ROSE.

SIR,—I have read in the *Journal* of Feb. 9 a letter, signed "W. B. M.," on this property, and expressing strong opinions against its future success. In the first place he must be entirely ignorant of the power required to drain the mine, as had he done himself the justice of visiting it before writing his letter, he would have found sufficient power erected to drain the mine to the bottom, as well as for the further developing of the property. In reference to the future value of the property my own personal knowledge of the mine (having been connected with it to the end of its last working) is a proof to me that "W. B. M." is altogether unacquainted with it. If "W. B. M." will kindly give his name and address, I will then gladly arrange a meeting and prove that his assertions as to its value are wrong. I now append my name and address in full.

Langstone, Brideston, Feb. 13.

WILLIAM SKEWIS.

THE EAST WHEAL ROSE GROUP.

SIR,—As one who has watched the progress of the East Wheal Rose group of mines, as they are termed, I cannot help noticing that Mounts Bay Consols has been kept in the background since the formation of the four companies; the only reason for this, as far as I can see, is the directors handed over to the vendors the purchase-money in cash, consequently, their (the vendors') interest ceased directly the money was received, whereas, in the other three companies, the bulk of the purchase-money was received by the vendors in fully-paid shares. Hence the reason Mounts Bay Consols have never been above par, whilst the other three have been at a substantial premium. I may further add that the mine in question (Mounts Bay) has sold

more mineral during the last two and a half years than any of the other three by several hundreds of pounds; and as to the property itself it is second to none in the county, and I believe that if the management were to give this property a little more of their attention (instead of throwing all their energy into East Wheel Rose and Old Shepherds) it would soon reach the Dividend List. I hope the directors are not playing into the hands of the promoters. By the way, I believe one of the vendors has a seat on the board of this company.

South Molton-street, Feb. 13.

FAIR PLAY.

MARKE VALLEY MINE.

SIR,—Having had to pay heavy calls in this mine for several years, I am pleased to find from the report issued at the last meeting that the lords have permitted the company to abandon the old workings, and to confine their operations to the western part of the sett at Wheal Jenkin; and this being a virgin piece of ground, situated in the mineralised zone lying between Phoenix and South Caradon Mines, I have no doubt of a revival of prosperity from an active development of the lodes here. The fact that sales of tin after only six months' working nearly meet the current expenditure seem to justify this hope.

The engines, plant, tram-iron, &c., from the old workings will prove a valuable asset—I should say not less than 10s. per share; but the directors ought not to force this on the market during the present depressed state of mining and the iron market. If any sales are made full particulars should be given in the balance-sheet sent quarterly to each shareholder. Instead of saying sale of spare machinery, as in the last balance-sheet, the kind of machinery, the price at which it was sold, and the name of the buyer should be given.—Cardiff, Feb. 11.

P. W.

WHEAL BENNY.

SIR,—Mr. H. Reynolds's letter in last week's *Mining Journal* has just caught my eye. I do not know the contents of the paragraph to which he refers; but he is quite in error as to his first and second sentences. Mr. Lang's freehold, running nearly 600 yards along the indicated course of the Benny lode, has been acquired on a mining lease for 21 years; and our agent, Capt. Cocking, reports that this is of the utmost value to the company.

We were aware that some person—I have not his name at the moment of writing, but presume it was Mr. Reynolds—had held the land previously; but his rights had expired, and Mr. Lang, acting on counsel's opinion, leased it to the company. I trust Mr. Reynolds will use more courteous adjectives—"totally false and misleading" are not proper to be used except upon very grave occasions.

It may interest your readers acquainted with the district to hear that a few days ago, just before my last visit to the mine, a deposit of exceptionally rich tin-bearing gossan ("rocks of pure tin" was the agent's description) was discovered on the outcrop of the lode close above the brace of the shaft. I brought a sample back with me to show the shareholders at the general meeting, and it is now at the office. The wheel, stamps, and drawing machinery were all working perfectly, and we hope within a very few weeks to sell tin derived from the above deposit, as well as from the stopes in the deep adit.

CHARLES W. CRAWFORD, Chairman.

Union Club, Feb. 10.

WHEAL COMFORT AND NORTH TRESAVEAN.

SIR,—It is highly encouraging to find that the prospects of this mine are steadily improving both for tin and copper. A winze has recently been sunk on the tin lode east of cross-course to about 8 fms. below adit. For the whole of this distance the tinstuff raised was of an average quality considerably above the average of the county. The lode is from 6 to 8 ft. wide, and presents every appearance of continuing to yield considerable quantities of tin, especially in an easterly direction, where they have nearly 300 fms. on the line of the lode to the boundary. It is proposed to drive the 10 fm. level east shortly, and should the lode continue as good in this direction as it is at the winze increased returns and profits may be looked forward to at no very distant date, as there is ample winding and stamping already on the mine. I consider there are also good chances of discovering important sections of tin ground above and below the adit to the west of cross-course, near to where a rich bunch of tin was discovered west of James's shaft.

At the 10 fm. level east, on the copper lode, a capital discovery of copper ore has lately been made, which looks likely to extend in an easterly direction, just under the junction of killas and granite. So it appears that this company is about to turn the corner. With the tin sales increasing and the returns of copper also on the increase, I am informed that at present the costs are being met to within 50l. or 60l. per month.

South Wheal Frances, Feb. 13.

CHAS. CRAZE.

FOREIGN MINING AND METALLURGY.

In the French Iron Trade prices have not shown any additional strength. Girders and merchants iron have been maintained at Paris at 6l. 12s. per ton. Forgemasters in the Nord have refused to do business below 6l. 4s. per ton at the works, and merchants are accordingly apparently selling at Paris without realising any profit upon their current transactions. The French industrial journals are carrying on a crusade in favour of a protectionist regime. The German iron trade has shown continued weakness, although prices have not experienced any sensible change. The production of pig in Germany in December amounted to 291,129 tons, as compared with 283,758 tons in December, 1882. The aggregate production effected for the whole of 1883 was 3,380,788 tons, as compared with 3,170,957 tons in 1882, showing an increase of 209,831 tons last year. The total of 3,380,788 tons, representing the production of last year was made up as follows:—Puddling pig, 2,045,396 tons; spiegel pig, 111,980 tons; Bessemer pig, 495,920 tons; Thomas pig, 369,685 tons; casting pig, 327,607 tons; and unspecified, 30,200 tons. The production effected by the blast-furnaces and ironworks of the Dortmund district in the last quarter of 1883 is returned as follows:—Pig, 272,698 tons; iron, 139,578 tons; and steel, 193,596 tons. The quantity of Westphalian coal forwarded to Hamburg last month was 43,620 tons, as compared with 40,680 tons in January, 1883, showing an increase of 2940 tons last month.

The aspect of the Belgian Iron Trade has become, if anything, a little less discouraging. The general downward tendency of prices, and business appears at any rate to have been checked. Sales have been also made of late a little more readily, and clients have shown more readiness to enter into engagements in advance—that is, for six months, and even for a year forward. This state of things is, however, far from being general, and complaints are still heard on several sides. Prices are maintained with a good deal of difficulty. English pig has fallen to 2l. 2s. 6d. per ton. Luxembourg casting pig does not sell above this price; but it is, nevertheless, disposed of without much difficulty. At Charleroi casting pig has not been quoted above 2l. 14s. per ton on an average, although some special marks have not gone lower than 2l. 16s. per ton. Hard refining pig has made 2l. 2s. per ton, while ordinary pig has brought 1l. 18s. per ton, and mixed pig 1l. 14s. per ton. No. 1 iron has continued to be quoted in Belgium at 4l. 16s. per ton, or thereabouts. Nos. 2 and 3 maintained a difference of 6s. per ton, bringing them up to 5l. 2s. and 5l. 8s. per ton. Girders have made 5l. to 5l. 4s. per ton. No. 2 plates have been quoted at 6l. 8s., and No. 3 at 7l. 4s. per ton. The exports of steel rails from Belgium last year are officially returned at 80,095 tons; iron rails were also exported from Belgium last year to the extent of 9576 tons. The John Cockerill Company has obtained a contract for steel rails required for the Italian supplementary railways.

The tone of the Belgian Coal Trade has not experienced any material change during the last few days. The winter months usually bring with them some advances in quotations; but this year the comparative mildness of the weather, coupled with the critical condition of metallurgical industry, has brought with it lower rates than usual. Some colliery proprietors have been making strenuous efforts to maintain prices; but others have shown, on the contrary, a readi-

ness to accept the situation, and, as the current production has been disposed of with a certain difficulty, concessions have been, upon the whole, the order of the day. Household coal has ranged from 10s. 5d. to 12s. 10d. per ton, according to districts. The imports of coal into Belgium last year amounted to 1,257,790 tons, as compared with 1,043,994 tons in 1882. In these totals English coal figured for 297,781 tons and 266,532 tons respectively. The imports of coke into Belgium last year were 38,453 tons, as compared with 15,082 tons in 1882. The exports of coal from Belgium last year were 4,431,970 tons, as compared with 4,292,025 tons in 1882. In these totals the exports to France figured for 4,144,418 tons and 4,053,816 tons respectively. The exports of coke from Belgium last year were 996,612 tons, as compared with 1,094,620 tons in 1882. France still continues, of course, the best external customer of Belgium for her surplus coal. The production of coal in the Dortmund (Germany) district last year is returned as follows:—First quarter, 6,833,268 tons; second quarter, 6,620,139 tons; third quarter, 7,009,403 tons; and fourth quarter, 7,400,146 tons; making a total for the year of 27,862,956 tons.

GAS FUEL IN MECHANICAL TRADES.

The absolute necessity of gas as a fuel for the economical carrying out of many commercial processes was ably maintained by Mr. THOMAS FLETCHER, F.C.S., of Warrington, in a paper "On Coal Gas as a Labour-Saving Agent in Mechanical Trades," recently read before the Society of Arts. Gas, he says, is often used in the crudest and most costly way; a burner may be perfect for one purpose, yet exceedingly wasteful for another, and however good it may be an error of judgment in its application may lead to its total condemnation. An excess of chimney draught, in cases where a flue is necessary, may pull in sufficient excess of cold air to almost neutralise the whole power of the burner unless a damper is used with judgment. With solid fuel an excess of draught causes more fuel to be burnt, but with gas the fuel is adjusted and limited; there is no margin or store of fuel ready to combine with the excess of air, which, therefore, lowers the amount of work done by its cooling power. The power of any burner, for any specified purpose, depends not only on its perfection, but to a far greater extent on the difference between the temperature of the flame, and that of the object to be heated. For instance, if a bright red heat is required it is not possible to obtain this temperature economically with any burner working without an artificial blast of air, the difference between the temperature of the flame and that of the object heated is too little to enable the heat to be taken up freely or quickly, and the result is a large loss of costly fuel. If we want to obtain high temperatures economically an artificial blast of air is necessary, and the heavier the pressure of air the greater the economy. On the contrary, low temperatures and diffused heat are obtained best by flames without any artificial air supply.

For such purposes as ovens, disinfecting chambers, japanners' stoves, foundries' core drying, and similar requirements, the best results are obtained by a number of separate jets of flame at the lowest part of the enclosed space, and the use of either illuminating or blue flames is a matter of no importance, as the total amount of heated air from either character of flame is the same. For the heating of liquids the greatest economy is to be obtained from one single flame of as high a temperature as can conveniently be obtained, and the flame must be in actual contact with the vessel to be heated. In jacketing vessels, to prevent draughts, care must be taken that the jackets do not cause currents of cold air to rise rapidly up the sides of the vessel, and so cool it. If this is the case the use of a jacket, instead of being an economy, is a positive expense, and waste of heat. Many processes, such as making oil and turpentine varnishes, require heat under instant control, and in these the use of gas is an important matter, as the loss and risk of fire are very serious elements of expense, more especially in small works where special and costly preparations for contingencies cannot be afforded. Fig. 1 represents a burner which, for its power, is, perhaps, the most compact, and gives the highest temperature of any burner yet known, and it is easily made in almost any size; it has, he thinks, many special advantages. The use of gauze, which is its only weak point, is more than compensated for by the very high duties obtained in practice with it owing to the compactness and concentration of the heat obtained.

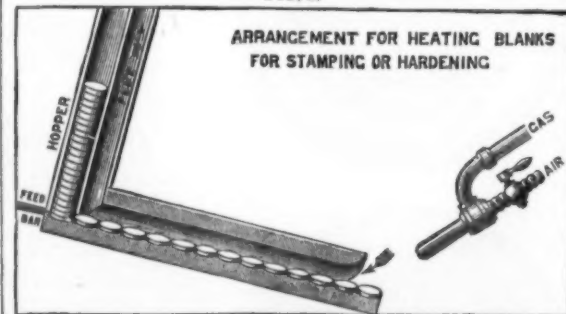
FIG. 1.
SPECIAL HIGH FURNACE BURNER



In such processes as the roasting of coffee, chicory, grain, &c., a diffused heat is necessary, but of much greater intensity than can be obtained with economy from heated air. In these cases the application of a direct flame is necessary, and it may be in actual contact with the substances to be heated provided these are kept in constant and rapid motion. The use of a revolving cylinder brings in complications with any burner which is supplied with gas at ordinary pressures without any artificial air supply as the currents of air caused by the motion of the cylinder interfere with the satisfactory working of any burner, and the air supply must be either protected from draughts and irregular air currents, or the air must be applied artificially from some independent source. One exceedingly good way of making any burner work, independently of the currents caused by a revolving cylinder, is to apply the flame inside the cylinder at the centre, making the substances to be heated to fall in a continuous stream through the flame. This system is not applicable to fine powders or sticky substances, as it necessitates the perforation of the cylinder to allow of the escape of products of combustion. For this class of work a very concentrated heat is not desirable, as a rule, and a slit or perforated burner is preferable.

For heating blanks for stamping the furnace bar-burner is perfectly suited, and in this work the shoot supplying the blanks to the machine should be made of two fire-clay slides with an opening for the flame between the shoot and flame being placed at a sharp angle to prevent risk of the blanks sticking or over-riding each other. A

FIG. 2.

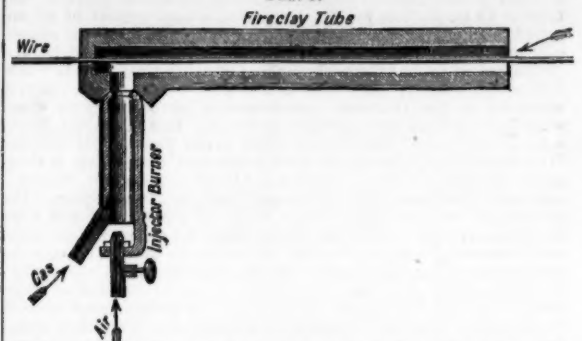


blowpipe may also be used with good effect, as shown in the above engraving, and in many cases it is preferable and much easier to manage. In some cases the direct contact of the flame would spoil the articles to be heated, and instead of the arrangement mentioned a tube of iron, fire-clay, or other suitable material is heated, and the articles are passed through it. This system of continuous feed through a tube has been applied to the firing of small articles of pottery, and might possibly be well adapted amongst other things to the production of gas-burners.

Where the contact of air with the heated articles is injurious many plans have been tried to keep the ends closed as much as possible, but I believe no more perfect and simple seal against the admission of air can be devised than to turn a jet of pure gas, unmixed with air, into each end of the tube. This is an absolute seal against the

entry of oxygen in an uncombined state; free oxygen cannot exist at a very high temperature in the presence of coal gas. For many trades there is a demand for hardened and tempered steel wire, either round or flattened, and the production of this has led to many attempts to obtain a satisfactory continuous process. The common

FIG. 3.



method now, which is worked as a secret process by most firms, is to pass the wire through a tube to heat it, as already described, and to run it direct from the tube through a hole in the side of a box filled with oil, the hole being packed with asbestos to prevent leakage; from this it is passed through another similar hole on the opposite side, either over a plate heated to the right temperature, or over a narrow open flame of sufficient length and power to give the correct heat for tempering.

Where absolute precision is necessary the gas supply must be adapted by an automatic regulator on the main to prevent the slightest variation of heat. Once adjusted the production of flat and round spring wire by the mile is an exceedingly simple matter. It is quite possible to obtain absolute precision in temperature by a proper adjustment of the gas pressure, and as this is for tempering steel articles and some other purposes, a matter of great importance, it is worth some consideration. No pressure regulator alone will give an absolutely steady supply, but if we put on first a regulator adjusted to the minimum pressure of supply (say) 1 in. of water, and then fix another on the same pipe adjusted to a slightly lower pressure (say) 9-10ths of an inch, the first regulator does the rough adjustment, and the second one will then give an absolutely steady supply, providing always that the regulators are both capable of passing more gas than is likely to be ever required. No regulator can be relied on for absolute precision if worked up to its maximum possible capacity.

The thousands of uses to which blowpipes are adapted are so well known that they need no mention except the curiously ignored fact that the power of any blowpipe depends on the air pressure. A compact flame of high temperature cannot be obtained except with a heavy air pressure, and the ignorance of this fact has caused an immense number of unexplained failures. Many people think that one blower is as good as another, and expect that a fan giving a pressure equal to (say) the height of a 2 in. column of water should do the same work as a blower giving a pressure 10 to 20 times as great.

In the more recent forms of gas-engine the charge is exploded by a wrought iron tube heated to redness by the external application of a gas flame. This, although considered satisfactory by the makers appears to Mr. Fletcher to be an exceedingly crude way of getting over the difficulty, and he offers it as a suggestion that a very small platinum tube shall be used instead of iron. This, if made with a porous or spongy internal coating, would fire the charge with certainty at a lower temperature than iron, and it could be made so thin and small in diameter, without risk of deterioration or loss of strength, that an exceedingly small flame could be used to heat it up. As it would be fully heated in a very few seconds the delay in starting would be obviated.

There are many purposes for which a red heat is needed for slow continuous processes on a small scale, such as case-hardening small steel goods, annealing, heating light steel articles for hardening, and a great variety of other similar processes. This until recently has required the use either of a rather complicated furnace or a blast of air under pressure to increase the rapidity of combustion. Since the conclusion of his experiments on the theoretical construction of burners he has found that the high-power burners previously described are capable of heating a crucible equal in size to their own diameter to bright redness without the assistance of a chimney, provided the crucible is protected from draughts by a fire-clay cylinder. For the highest temperatures air under pressure is a necessity, as we require a large quantity of gas burnt in as small a space as possible with the maximum speed, and, given this air supply, we are very little hampered by conditions, as an explosive mixture may be blown through a gauze into a fire-clay chamber, closed, except so far as is necessary to allow the escape of burnt gases. The speed of combustion is limited only by the speed of supply of air and gas, and by increasing these there is no practical limit to the heat which can be obtained. When we have to do with the reduction of samples of refractory ores, testing the comparative fusibility of different samples of fire-bricks, or alloys, &c., the use of an explosive mixture blown into and burning in a close chamber is invaluable, and the ease and certainty with which any temperature may be obtained has led to great discoveries, and the revolutionising of many commercial processes.

In the discussion which followed the reading of the paper the Chairman, Prof. W. CHANDLER ROBERTS, F.R.S., said it was well known that the general laws guiding the combustion of gaseous fuel had been laid down by Scheurer-Kestner, St. Claire Deville, and Frankland, and they all knew that the late Sir William Siemens had obtained splendid results by the use of gaseous fuel. Quite apart from the industrial application of gas its use was of great importance, especially at a time when so many efforts were being made to get rid of the nuisance arising from smoke. Perhaps the most interesting point developed in the paper was the fact that explosive mixtures of gas and air could safely be introduced into a chamber provided it was previously heated. In many of the appliances ordinary illuminating gas was employed, and that, of course, was not the most economical method; but these were put forward rather as labour-saving appliances than as being economical in every respect. He could speak with real gratitude of Mr. Fletcher's labours, for he was constantly using several of his furnaces in the Mint for ordinary assaying purposes. Mr. W. R. E. COLES said he could endorse from his own experience what the Chairman had said of the value of Mr. Fletcher's apparatus for laboratory purposes, and he also knew that some of his cooking stoves were very effective. Mr. BOWER remarked that he had used Mr. Fletcher's furnaces for a long time in his laboratory as an amateur; and so far from finding fault with the improvements which he made from time to time, he was quite sure that each new one gave him greater power than he had before. Colonel CAMPBELL asked Mr. Fletcher whether he thought there was a possibility of using the gas from peat as a source of motive power? Mr. GUMPEL said there were many places in the country where coal gas was not available, and he should like to know if the gas produced by the Alpha or the Sunlight machine could be used with Mr. Fletcher's apparatus.

Replying to the various questions raised Mr. FLETCHER said that as to the pressure of gas that was out of his department. A pressure-giving governor was equivalent to what was known as a power-meter; a meter driven by a weight which would give pressures considerably above what were now obtained. This apparatus could be obtained from several makers. The grilling of meat over a flame was already done successfully, and the appliances were to be had. He had had no experience in the use of peat gas, and could not, therefore, say anything about it, as he confined himself entirely to that which he had actual knowledge of. There was a pretty extensive peat bog near to where he lived, and if ever it were utilised and peat gas made he might be able to say something about it.

THE ELECTRIC LIGHT IN OUR HOMES.

Although it is perhaps unlikely that, considered from an economical point of view, electricity can, at least until invention and discovery has been carried much further than at present, successfully compete with gas as a popular illuminant, electric illumination has so many advantages and recommendations for special purposes that there is an ample field for the remunerative employment of all engaged in supplying electric lights. For some time past the simplicity and economy of electric lighting has been discussed by Mr. Hammond in various towns throughout the kingdom, and the substance of his lecture—extended so as to give details which, however necessary to the thorough comprehension of the subject, could scarcely be introduced in a single lecture—is now given in a handsome little volume—*The Electric Light in our Homes*. By ROBERT HAMMOND (the Hammond Electric Light and Power Supply Company). London: Frederick Warne and Co., Bedford-street, Strand—admirably illustrated with photographs and wood engravings. The preliminary chapters on the Older forms of Illuminants and their disadvantages and on the first step towards obtaining perfect light are followed by a chapter on the incandescent lamp. In this the author traces the progress made in obtaining the illuminating filament since 1841, of course, referring to the carbon filament of King, 1845, which may be regarded as the basis of incandescent electric illumination. The various materials used for the production of the carbon are noted, as well as the forms preferred by the various makers.

That the air in an apartment illuminated by electricity is entirely free from the contaminations which, with every other description of a tificial light, is alike injurious to the health of the occupants and to the embellishments of the apartment itself has been long admitted, and Mr. Hammond, by carefully explaining the reason of this, does much to create a friendly feeling toward the incandescent lamp. In the matter of safety again the electric light is unsurpassed, for it is beyond question that the wires once properly laid, even the ignition of an inflammable material with an incandescent lamp is impossible; whilst the globe is perfect the glowing filament cannot be reached, and if the globe be broken, accidentally or otherwise, the light is instantly extinguished. The absolute safety of this system of illumination is certainly among its greatest recommendations. It cannot be denied that in many cases electricity is much more costly than gas as an illuminant, but this is not always the case. When a light equivalent to 2000 or 3000 candles is required in a single apartment, be it a library, a museum, or an assembly room, the cost of electric illumination, whether by arc or incandescent lamps, would be no serious objection, whilst its absolute safety and the fact that it does even less injury to the objects in the room than daylight, should suffice to ensure its adoption. It is shown that the electric light is as perfectly under control as the best arranged gas-burner, and that with the incandescent system gradations of light can be as readily obtained as with gas. To demonstrate that electricity is not too costly when used as an illuminant, Mr. Hammond explains how the electric current is produced, tracing its production from the single pair of plates in the primary battery to the most approved "20,000 lighter."

But upon the question of introducing the electric light into our homes the chief consideration is without doubt the production of the current. It is as unreasonable to suppose that each consumer can economically produce electricity for his own requirements as to suppose that he can economically produce coal gas to illuminate his residence with an experimental retort over the kitchen fire, but there is no valid reason why current should not be supplied precisely in the same way as water, and it is probable that wherever a demand for only 1000 lights exists in the residences within a small area the current could be supplied at a price so little above that of gas that consumers would be quite satisfied, whilst the supplier would realise a handsome profit. The supply of electric current will doubtless be made a highly remunerative industry in the immediate future, and by the careful study of Mr. Hammond's book such an insight into the matters to be dealt with, and the mode of dealing with them, will be obtained that every capitalist will be well able to watch his own interest. The book is thoroughly popular in style, and free from needless technicalities, so that it will be equally intelligible and interesting to all classes of readers.

THE NEW LAW OF PATENTS, DESIGNS, AND TRADE MARKS.

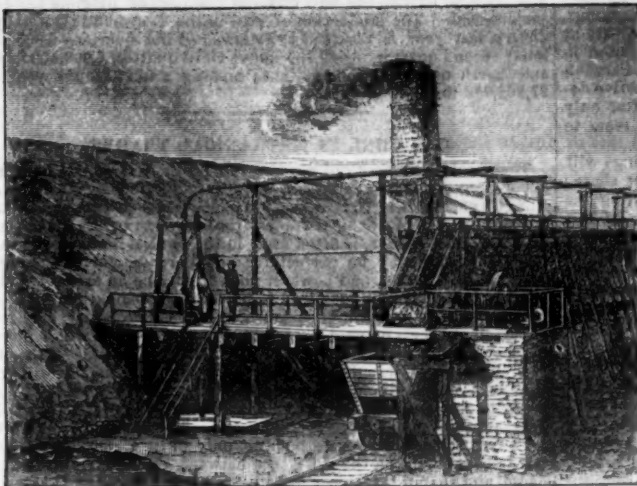
The new law, which came into operation with the present year, has already so vastly increased the number of applications for patents that more numerous disputes among inventors may reasonably be expected; hence such a work as that of Mr. Daniel—*A Complete Treatise upon the New Law of Patents, Designs, and Trade Marks*, being the Patents, Designs, and Trade Marks Act, 1883, with the rules and forms, fully annotated with cases, and a statement of the principle of the law upon these subjects, with a time table and copious index and an abridgment of the Cutler's Company Acts, by E. MORTON DANIEL, of Lincoln's Inn, Barrister-at-Law, Associate of the Institute of Patent Agents—becomes a necessity. It will be seen that the author, in dealing with his subject, professes to do so in a very exhaustive manner, and it is the fact, it is believed, that this is the only treatise which attempts to embrace the law upon all the matters included in the Act of last session. During the present year a large number of works on patent law have either already appeared or are announced to appear in the course of a short time; but as far as can be ascertained each of these deal only with the law relating to patents. That, of course, may be the most important of the new subjects of the recent legislation, but the other two are also of much importance, and a work relating to all three is, therefore, to be hailed with satisfaction if it is a complete treatise, as Mr. Daniel's book professes to be.

Upon careful perusal it becomes evident that Mr. Daniel's work is fully equal to its profession. It consists of two distinct parts. The first part, in three chapters, deals with the law of patents, designs, and trade marks respectively. The difficulty of dealing with a subject of this kind is that it may be treated in either of two ways—that is to say, it may be designed from the lawyer's point of view for the use of lawyers, or it may be written by a practical patentee or patent agent for the use of patentees and agents. If one of these systems be adopted to the exclusion of the other the work must necessarily be of less utility. In the part of Mr. Daniel's work now referred to he has very successfully treated the subject, so that it may satisfy the wants of lawyer, patentee, and agent. The authorities are cited, doubtful points of law indicated and discussed; on the other hand, information of a practical kind is given upon every point, from the true nature of a patent up to the most minute detail of the specification and claims. Mr. Daniel has done wisely, in our judgment, in avoiding the usual style of legal text-book which burdens every sentence containing a statement of principle with microscopic qualifications; an ordinary law book is thus rendered all but unintelligible to a lay reader, for it is never easy to extricate the main principle from the mass of detail, often unimportant, with which it is clogged. It must not be imagined, however, that details are ignored; so far as can be judged every important qualification of a general proposition is stated, though it is subordinated according to the degree of its importance. We can, therefore, commend this part of Mr. Daniel's work as being complete and clearly expressed. It bears the marks of much learning and care in its preparation.

The other main part of the work, that consisting of the Act and notes, will be especially valuable to the lawyer. The notes are concise, but clear. Difficulties of construction are pointed out and discussed. Authorities are cited, and generally the notes may be said to contain all that at present can be written until the process of judge-made-law begins to operate with reference to them. The time-table is a novel and useful addition to the work. It is alphabetically arranged, so as to show at a glance the times within which the various proceedings regarded by the Act must be taken. The index is full and well arranged. Mr. Daniel's work will be found well worthy the attention of all who are practically interested in patents, designs, and trade marks, and may safely be commended to the readers of the *Mining Journal* as a book calculated to render them important service.

REWARDS FOR INVENTIONS.—Following the example of Messrs. Donny Brothers, of Dumbarton, Messrs. Edward Withy and Co., of Hartlepool, have decided to adopt the system of giving rewards to such of their workmen as may devise or introduce improvements in the machinery or appliances used on their premises, and have appointed a committee to carry out the scheme. This body has power to grant sums from 2*l.* to 10*l.* according to the opinion they may form of the value of the invention to any workmen in the employ of the firm: (1) who has invented or introduced a new machine or hand tool into the yard; (2) who has improved any existing machine or

hand tool; (3) who has applied any existing machine or hand tool to a new class of work; (4) who has discovered or introduced any new method of carrying on or arranging work; or (5) who has made any change by which the work is rendered either superior in quality or more economical in cost. In case they consider such a reward inadequate they are to report to the firm, who, if they see fit, will grant a further sum, or will obtain provisional protection for the inventor, so as to enable him to carry his invention into the market either to sell it or to obtain the co-operation of a capitalist. In any case Messrs. Withy retain the right to avail themselves of the improvement free of all royalty or patent rights.—*Engineering*.



The above Illustration shows a Pulsometer as applied at a Colliery.

See following Extract from Testimonial:—

"We have no trouble with the Pump through choking, although during one week we clear about 100 tons of small dust out of ponds for the purpose of settling water. Even with this it still pumps a great quantity of almost slurry coal back to top end of box. I might say it has far exceeded our utmost expectations all the time we have had it applied to coal washing."

PULSOMETER ENGINEERING COMPANY, Limited,

NINE ELMS IRONWORKS, LONDON, S.W.,

And 61 and 63, QUEEN VICTORIA STREET, E.C.

The Pulsometer.

PATENT STEAM PUMP

Is admirably adapted for all difficult and awkward situations, especially where the Pump has to be suspended on a chain as in sinking operations. The absence of exhaust steam is a great convenience in confined situations. Having no moving parts except the simple and easily replaceable valves it is invaluable for coal washing and ore washing purposes, as it does not cut out with grit and sand as other Pumps do.

SEE CHANGE OF ADVERTISEMENT EVERY FORTNIGHT.
And please mention paper when enquiring.

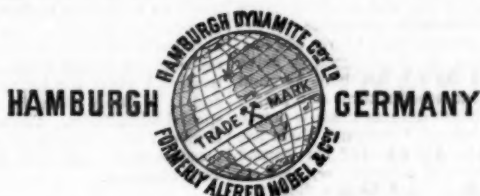
MINING PUMPS FOR ALL DUTIES.

Horizontal Plunger Pumps for Gritty Waters and Heavy Pressures.

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BEST PRICES AND TERMS ON APPLICATION.

BAXTER'S PATENT KNAPPING STONE BREAKER.



1891.



FACTS SPEAK FOR THEMSELVES.



To Mr. Baxter, Leeds.

Cinderford, Feb. 13, 1893.

DEAR SIR,—I am pleased to be able to tell you that the Machine works splendidly. We are breaking 16 trucks a day now, and we thought it a good day's work to do 10 a day with the old Machine, so you can see the difference. I had a gentleman looking at it yesterday, and he was surprised to see it work so easily. Yours truly, E. ORGAN.

The above refers to one of our 16 by 9 Machines we supplied to replace an "Improved Blake" 15 by 9 Machine. Several of which have already been replaced by Baxter's.

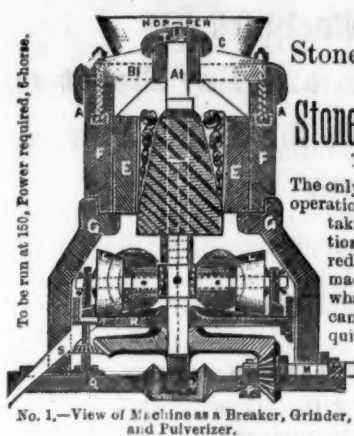
PATENTEES AND SOLE MAKERS,

W. H. BAXTER & CO., ALBION STREET, LEEDS.

Pumping Engines
for
Mines, Water Works,
Sewage Works,
and
General Purposes.
CATALOGUES ON

PUMPING & MINING MACHINERY. HATHORN, DAVEY, & CO., LEEDS.

Hydraulic Pumps.
Winding Engines.
Air Compressors.
Man Engines,
Capstans,
&c., &c.
APPLICATION.

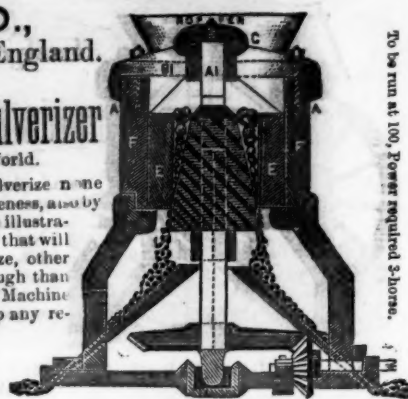


No. 1.—View of Machine as a Breaker, Grinder, and Pulverizer.

S. MASON & CO., Stone Machine Works, Leicester, England. NEW PATENT CIRCULAR Stone & Ore Breaker, Grinder & Pulverizer

The Simplest and Strongest Machine in the World.
The only Machine made that will Break, Grind, and Pulverize in one operation either wet or dry mineral to any degree of fineness, also by taking away the rollers it will break to any size (see illustration No. 2.) This is the only machine in the world that will reduce all that is put into it to the required size, other machines open and shut, so let larger sizes through than what is wanted, besides mixing them together. A Machine can be seen at the Works in motion, breaking up any required mineral.

READ THIS—
Lord Donnington's Works, Cloud Hill,
Near Ashby-de-la-Zouch, Nov. 29, 1883.
Gentlemen,—The Breaker, Grinder, and Pulverizer is working well, and giving satisfaction.
Yours truly,
J. W. STABLEFORD, Manager.



No. 2.—View of Machine as a Breaker for different sizes.

To be run at 100, Power required 3-horse.

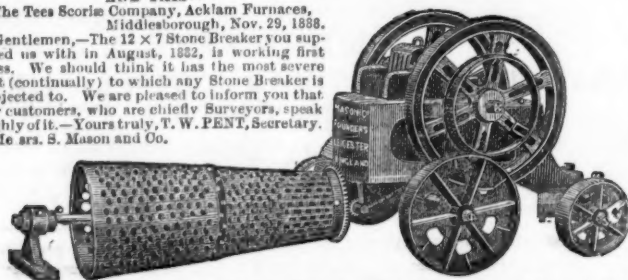


M. & Co.'s Roller Mill for Stone, Ore, Bones, &c. The teeth are made harder than steel, and slide on a cylinder, so are easy renewed when required, and are made to suit any material.

READ THIS—
From the Kettering Iron Company, Kettering.
Messrs. S. Mason and Co.—Gentlemen,—As regards the test with your Machine and Baskets, we think yours far superior, and have decided to give you the order, so please to let us have one of your 20 by 9 as quick as possible.
Yours truly, H. J. PRESTON.
N.B.—Since supplying the above we have received orders for 5 more.

To Messrs. S. Mason and Co.,
Dear Sirs,—The six Stone Breaking Machines you have supplied to us are doing their work well and giving every satisfaction. Our stone being so hard, we have broken several Machines that we had bought from other firms, but the Machines purchased from you are strong enough to meet our requirements.
Yours truly, S. D. POCHIN, Croft Quarries, near Hincley.

AND THIS—
The Tees Searle Company, Acklam Furnaces,
Middlesbrough, Nov. 29, 1883.
Gentlemen,—The 12 x 7 Stone Breaker you supplied us with in August, 1882, is working first class. We should think it has the most severe test (continually) to which any Stone Breaker is subjected to. We are pleased to inform you that our customers, who are chiefly Surveyors, speak highly of it.—Yours truly, T. W. PENT, Secretary.
Messrs. S. Mason and Co.



S. M. & Co.'s Improved Blake Stone Breaker with Reversible Swing Jaw and Screen. This Jaw is reversible in four ways—twice as many as any other. All our Machines are fitted with steel eccentric shafts and toggle cushions. We guarantee no infringement of any patent. References to hundreds of users.

THE TUCKINGMILL FOUNDRY COMPANY, (TUCKINGMILL FOUNDRY AND ROSEWORTHY HAMMER MILLS), CAMBORNE, CORNWALL, Engineers, Iron and Brass Founders, &c.



REGISTERED TRADE MARK.

MANUFACTURERS OF EVERY DESCRIPTION OF

REGISTERED TRADE MARK.



PUMPING WINDING AND STAMPING ENGINES
ALL KINDS OF
MINING MACHINERY, SHOVELS, AND
MINERS' TOOLS;

ALSO OF
BLAKE'S STONE BREAKERS.

ESTIMATES GIVEN UPON INDENTS AND SPECIFICATIONS.
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THE NEW PATENT FLAX BELTING.

The Only Good Belt made of Textile Fabric.—Manufactured solely from the best Russian Flax.
SPECIALITY FOR DYNAMOS, SAW MILLS, AND MAIN DRIVING PURPOSES.
Price List and Particulars from—

B. A. BARCZINSKY, 21, Albany-street, LONDON, N.W.

SILVER MEDAL (HIGHEST AWARD) MELBOURNE, 1881.

JOHN SPENCER,

Globe Tube Works, WEDNESBURY,

AND 3, QUEEN STREET PLACE, CANNON STREET, LONDON, E.C.

FIRST PRIZE, SYDNEY, 1880.

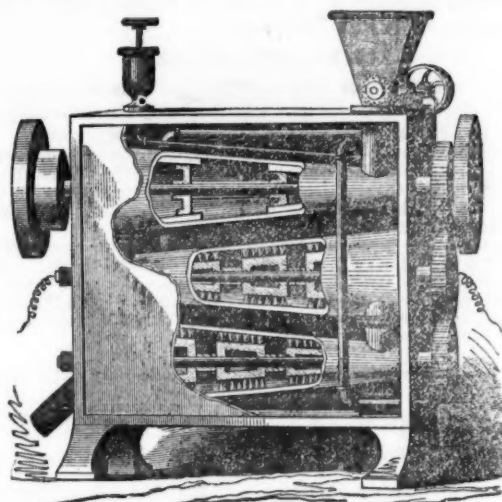
TUBES AND FITTINGS for Gas, Steam, and Water; Galvanised, Enamelled, and Hydraulic Tubes; Boiler Tubes and Fittings; Gas Fitters' Tools; Brass Cocks, &c.
ANTI-CORROD TUBES AND FITTINGS COATED BY BARFF'S RUSTLESS PROCESS.

TUBES

NOVEL ELECTRO METALLURGICAL MACHINE.

PROFESSOR JAMES MANES AND SONS call the attention of miners, mineowners, capitalists, and others interested in the working of gold or silver mines to their new Electro Metallurgical Machine for extracting fine and rusty gold from sands or tailings of stamp mills, or the sands of hydraulic gold diggings, or from the black sands on the coast of Oregon or California, and other parts of the world where gold is found.

The problem that has long troubled the worker of free-milling gold and silver ores is a method to save the mineral now lost in the tailings of stamp mills or flumes. This alone, if it could be saved, would amount to many million dollars profit each year, besides enabling the working of much territory which is now lying idle for want of an economical and thorough process of treatment.



Prof. James Manes and Sons, of Denver, Colorado, U.S., have invented a machine (represented in the above engraving) which it is claimed will save nearly the entire amount of mineral which passes through it, the loss not being over 10 per cent., and in many cases not in excess of half that amount. The machine is a cheap and practical process—it never need stop for charging or cleaning up, being nearly self-acting. Steam, electricity, and mercury are used in the process of extracting the mineral.

This machine or amalgamator is adapted for free-milling gold or silver ores, or refractory after roasting. It consists of a series of three or more large cylinders, wider at one end than the other, placed one above the other in a horizontal position, a shaft or spindle running through the centre of each.

The ore and mercury are fed into the first cylinder, passing into the second, and then to the third. The first cylinder is furnished with steel mullers which nearly touch the sides of the cylinder, and revolve at a good rate of speed, mixing the mercury and ore. The second cylinder is furnished with large steel brushes attached to the shaft or spindle, revolving at a high rate of speed; through this a current of electricity is furnished by a Westinghouse dynamo machine, which materially assists in gathering the particles of very fine gold together, and thoroughly amalgamating the metal and mercury. The third cylinder is similarly furnished to the second; into this the amalgam passes, and is again acted upon and mixed by the brushes to catch any gold which might have escaped amalgamation in the second. A fourth cylinder may be used if found necessary.

The amalgamated pulp then passes through a revolving copper drum, plated with quicksilver inside. As the drum revolves it takes up the most part of the amalgamated gold. As the inside of the drum is constantly washed with a spray of water from perforated pipes fixed inside of said drum, a clean-plated surface is constantly brought in contact with the pulp or tailings as it passes out from the cylinders. After leaving the drum it falls down on to incline copper plates, the same as is now used in stamp mills.

The amalgam can be collected from the drum and plates without stopping the machine, and any live quicksilver that passes will be caught in syphons. The tailings are carried off with the water. The machine when attached to the flume will be driven by the waste water; it lifts the fine sands from the coarse gravel, and amalgamates it as above.

The specific points claimed by Prof. Manes and Sons in their patent are—
1.—The saving of almost all the mineral passing through the machine.
2.—The loss being less than 10 per cent.
3.—The entire absence of loss of the amalgamated material, thereby saving all the mercury, which, with the processes now in use, there is a large loss both of mercury and the precious metal.

4.—The small cost per ton at which the ore can be treated.
By the addition of the powerful current of electricity that passes off the revolving brushes, the most minute particles of gold will be caught and retained, which in the ordinary flume and stamps passes off with the water; this often amounts to a large percentage.

The inventors state that if English stock companies will give their assistance to work the black sands of Oregon and California by paying for the building of the machines, they will take a share of the gold for their services, or they will send their machines to any part of the world, or will sell patent rights to those desiring any of their patent machines or revolving furnaces for roasting or smelting ores, ball pulverisers, &c.

Prof. James Manes and Sons are agents for the Morey and Spary Ball Pulveriser, that crushes and pulverises at the same time, and does as much work as eight stamps in a day, crushing either wet or dry.

PRINCIPAL OFFICE OF

Prof. MANES and SONS,

No. 9, Windsor Block, Denver, Colorado,
U.S.A.

All our machines and furnaces are made by the Colorado Iron Company of Denver, Colorado, the most extensive mining machine works in America.

INCREASED VALUE OF WATER-POWER.

MacADAM'S VARIABLE TURBINE.

This Wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, and yet work with equal efficiency through all variations of quantity down to a fifth, or even less if required. It is easily coupled to a steam-engine, and in this way always assists it by whatever amount of power the water is capable of giving, and therefore saves so much fuel.

This Turbine is applicable to all heights of fall. It works immersed in the tail-water, so that no part of the fall is lost, and the motion of the Wheel is not affected by floods or back-water.

These Turbines are at work in nearly every county in England. Apply to—

MacADAM BROTHERS AND CO.,
BELFAST.

MINING MACHINERY, MILLING MACHINERY

Of the MOST APPROVED AMERICAN PATTERNS.

GOLD MILLS.

The California pattern of Gold Stamp Mill is universally accepted as the most perfect, economic, and efficient made.

We have over 900 stamps in successful work in the various Western Gold Districts.

SILVER MILLS.

Silver amalgamation in Pans is essentially an American system evolved after years of work on the rich silver mines of Nevada.

We have over 500 Stamps, with necessary pans, settlers, roasting furnaces, &c., all of our own manufacture, at work in different silver camps of the United States, Mexico, and South America, and Philippine Islands, Asia.

CONCENTRATION MILLS

Of the most approved German pattern and arrangement, or with Stamps and Frue Vanner Concentrators for low grade silver ores, light in lead. We have over 20 large German pattern mills at work on lead, zinc, or copper ores, and numerous Vanner mills on ores never before successfully concentrated.

Mining Pumps, Cornish pattern, of the largest sizes. Hoisting Engines, from 4 h.p. up to the largest direct-acting engines to sink 3000 feet.

SMELTING WORKS.

We have 80 Water Jacket Smelting Furnaces in use from 20 in. circular up to 54 in. by 60 in. for lead and silver smelting; and special High Jacket Furnaces for copper ores.

Engines of any size, plain slide valve, Corliss, compound Corliss, Boilers, all sizes. Leaching Mills, Hallidie Wire Rope Tramways, Comet Crusher, with capacity of 12 to 20 tons per hour. White, Howell, Bruckner, and Stetefeldt Roasting Furnaces, &c.

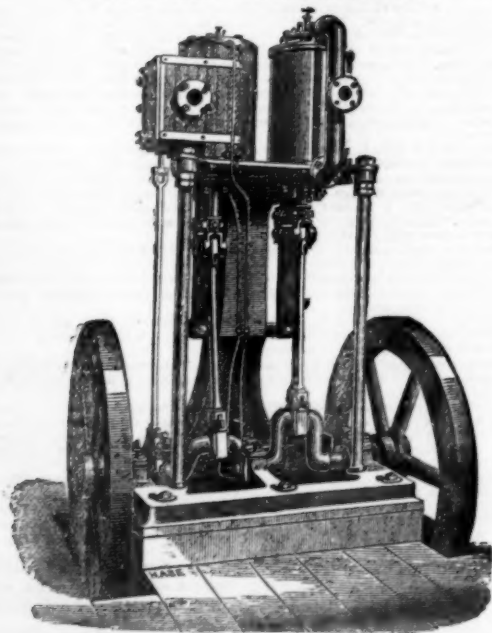
We have had twenty years' experience in the manufacture solely of MINING MACHINERY, and have special facilities for shipping to all foreign parts through our New York Office, where all details of clearance, shipment, and insurance are conducted. Our machinery is already well known in Mexico, Peru, Chili, Venezuela, Honduras, and other South American countries.

Correspondence solicited. Descriptive Circulars and Catalogues on application.

FRASER AND CHALMERS.

PRINCIPAL OFFICE AND WORKS. NEW YORK OFFICE.
Fulton and Union Streets, No. 2, Wall Street,
Chicago, Ill., U.S. New York, U.S.
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THE "Champion" Rock-borer AND AIR COMPRESSOR.



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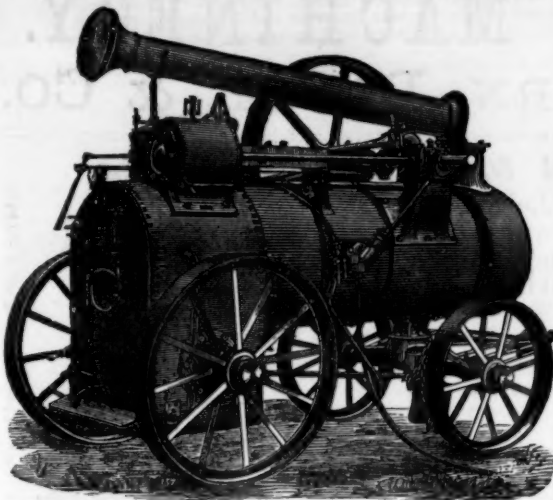
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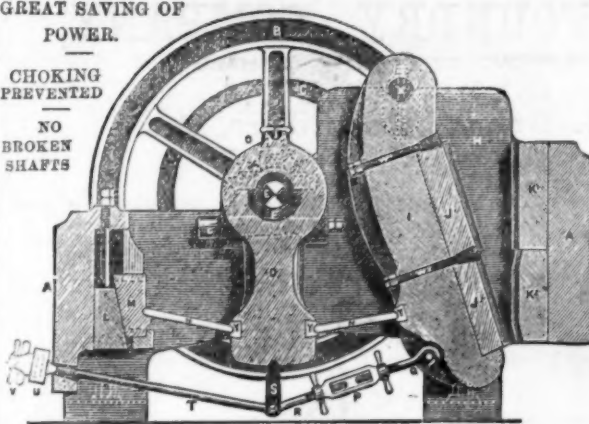
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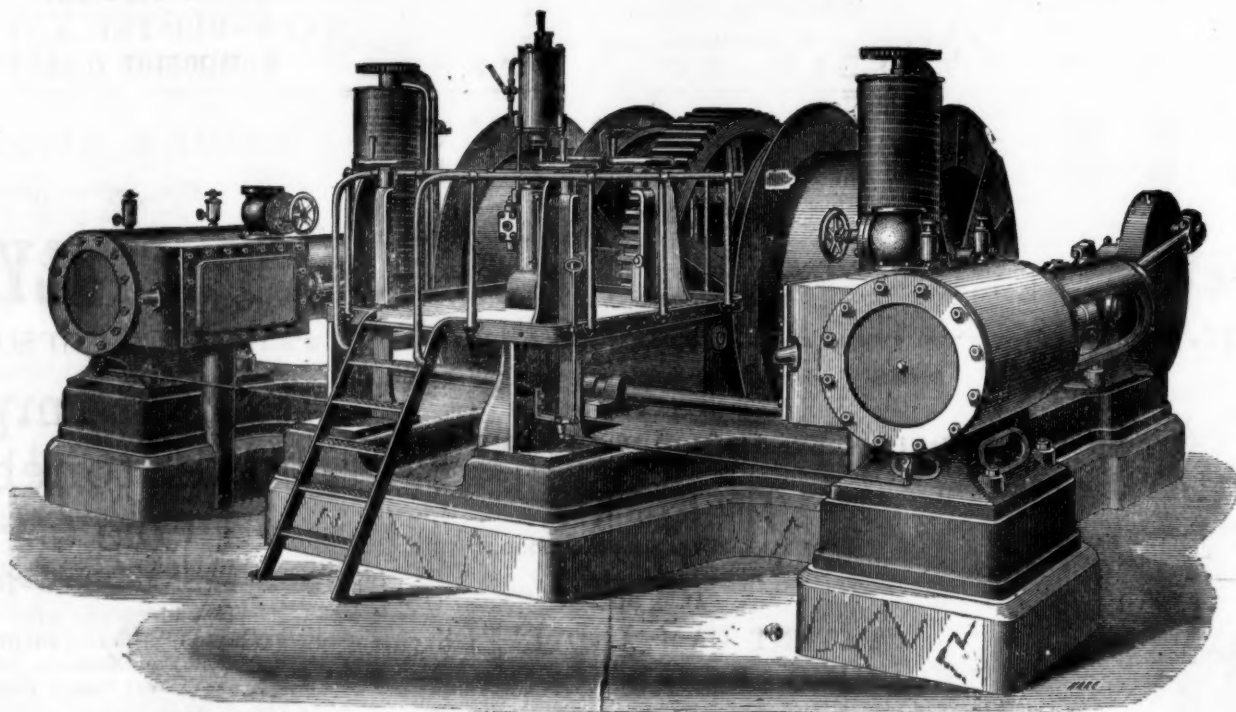
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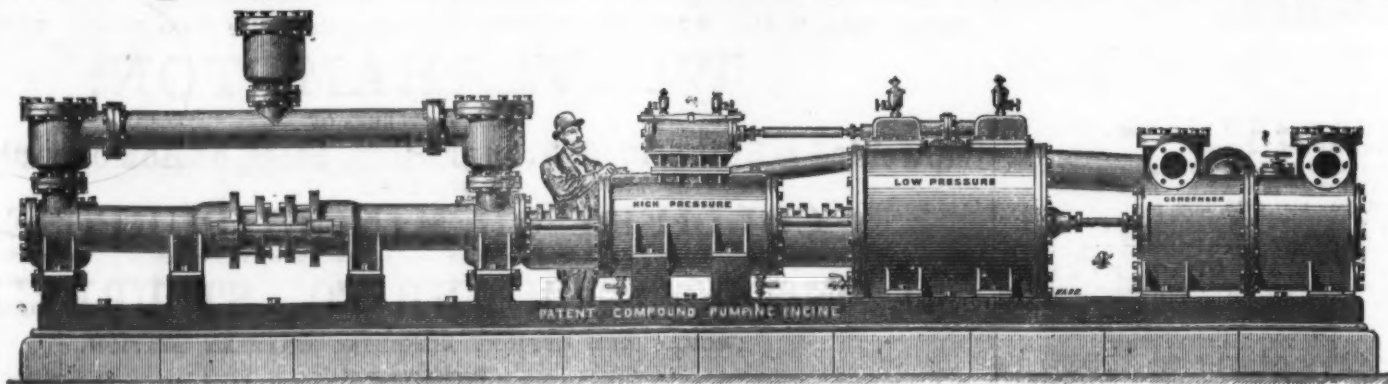
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"I have great pleasure in bearing testimony to the merits and capabilities of your patent combined fine crusher and sieving apparatus. I have tried it on a variety of ores and minerals, and it pulverizes them with equal success. You can put in a small paving stone and bring it out like flour."

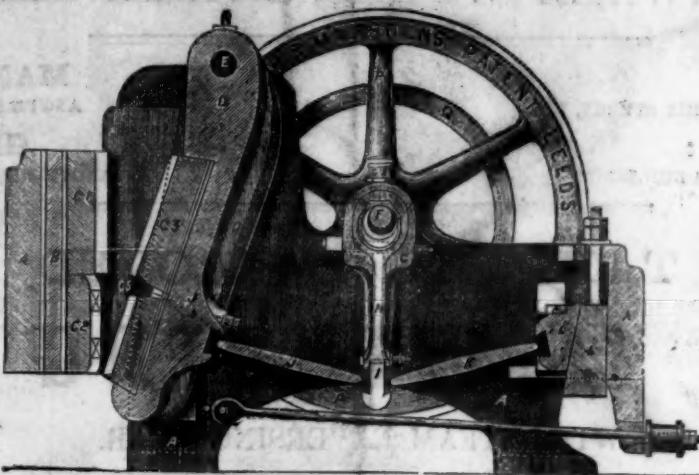
"In reply to your favour, I have much pleasure in informing you that the 12x3 Pulverizer we had from you is giving us every satisfaction. The material we are operating on is an exceptionally hard one. I am well satisfied with its working."

"Our experience is that the motion and mechanical arrangements of your machine are the best for pulverizing that we have ever met with."

"The reports from our mines as regards the working of your Fine Crusher (20x5) recently supplied are very favourable, although we cannot quote you exact figures. On being got into position it was tried by hand, with the result that it made short work of the biggest pieces of ore we put into the hopper. You might say how long you would take to deliver another of the same size."

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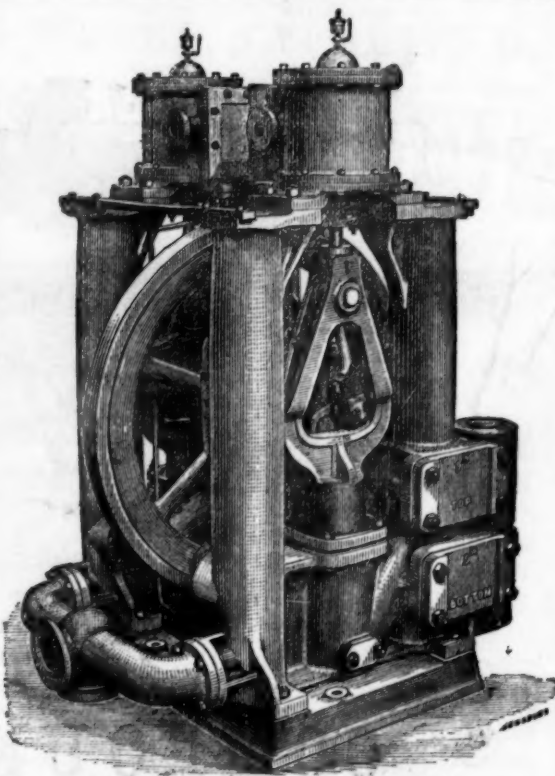
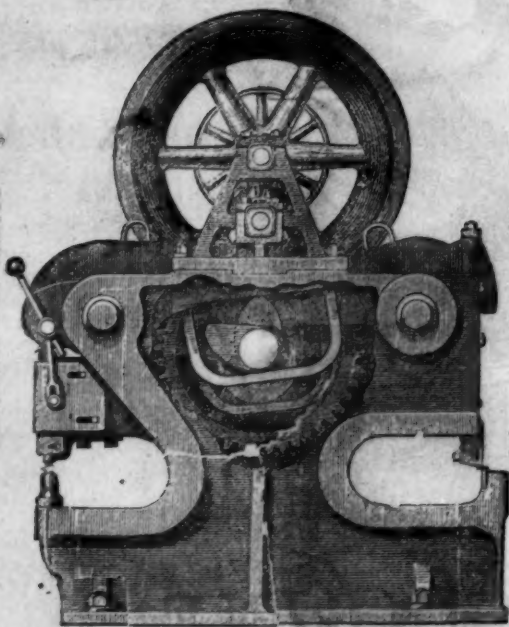
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